BBC MICRO·MASTER·ELECTRON·ATOM

£1·30

ACORN USER

JUNE 1987

BEST-SELLING AND BIGGEST BBC/ACORN MAGAZINE

SPECIAL ISSUE

MAGAZINE MAKERS

Publishing with your own micro

ACORN FORUM: Swap ideas with the experts

GAMES REVIEWS: Four pages of latest releases

MASTER WIMPS: Major listing puts icons to work

RISC CHIP: Inside Acorn's new micros





The Superior Collection Volume 1 features one brand new game, Syncron, together with 7 of Superior Software's classic hits for the BBC Micro.

Syncron is a fast-action game set against a backdrop of an enormous graphically-detailed scrolling landscape. The landscape is, in total, 1024 times the size of the screen. You must endeavour to complete 16 hair-raising missions; in each mission you have to collect a number of power cylinders, land your spacecraft on a runway with each cylinder in turn, and finally locate and bomb the HQ Building. Whilst skilfully manoeuvring your spacecraft between the defence pylons and force-fields, you are attacked by alien spacecraft and missiles launched from the land bases. A superb game, worth at least £7.95 in its own right.

BBC Micro dual cassette	**£9.95**
BBC Micro 5¼" disc	**£11.95**
BBC Master Compact 3½" disc	**£14.95**

Here's what the computer press said about some of the other titles on this compilation package:—

REPTON: "This is an astounding game reaching new heights in BBC arcade adventures." ... MICRO USER

KARATE COMBAT: "Superior's Karate Combat is a superb karate simulation.
Graphics 9
Sound 9
Value 8
Playability 10."
... COMPUTER & VIDEO GAMES

C+VG HIT!

AIRLIFT: "Airlift is an excellent arcade game ... It has a very polished presentation that cannot fail to impress and has the element of addictiveness which keeps you going back for one more try."
... A & B COMPUTING

SMASH AND GRAB: "As usual with Superior products the graphics are excellent, with a good use of colour and no flicker. I expect this game will have you rolling with laughter. I certainly did.

Instructions	95%
Playability	95%
Graphics	100%
Value For Money	100%

Awarded ★★★★★ (Top Rating)"
... HOME COMPUTING WEEKLY

All games are compatible with the BBC B, B+ and Master series computers.

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When you use the Nidd Valley mouse the first thing you'll appreciate is the stable, non-slip, accurate control – so important for graphics and free-hand drawing.

You'll also notice the "chunky" feel – it's designed to fit comfortably in your hand.

A feature UNIQUE to Digimouse is the LINEAR LOCK switch which enables you to draw perfectly straight lines freehand in X or Y directions independently of the software.

Not only do we offer a choice of two drawing packages (details below) but also you have the freedom to use Digimouse control in your own software with the help of the POINTER ROUTINES supplied.

Just as important, it's compatible with many other graphics packages including AMX and Wigmore.



AVAILABLE FOR BBC B/B+/MASTER 128 and MASTER COMPACT with a choice of software.

Grafik

A user-friendly, low cost introduction to CAD.
Options include:
★ Mouse sensitivity control ★ Choice of BBC graphic modes ★ Printer dump to any Epsom type printer ★ Save screens and re-use in your own programs ★ Large drawing area ★ Alignment grid ★ Rubber banding ★ Colour and fill ★ Text insertion.

GRAFIK is supplied on disc complete with Digimouse pointer routines plus a comprehensive, clearly written operating guide and demonstration.

Introducing... CHAUFFEUR

For the first time, you can now run almost ANY SOFTWARE under mouse control by programming your mouse to emulate any key (except Control & Escape).
With this unique, user friendly utility you can use your mouse to control the vast majority of programs and games including View, Worldwise, Repton 3 & Mini Office II.

POINTER – for normal mouse control
CURSOR – automatically emulates cursor keys, copy, delete and return keys.
USER DEFINED – to program keys of your choice for mouse emulation. Save to disc for subsequent quick load.

Your Chauffeur awaits you, supplied as 16K ROM image for loading into Sideways RAM. Available for BBC B/B+, Master 128 & Compact.

ARTROOM from clares

An impressive graphics design package in superb high-resolution monochrome. Features:
★ Extensive library of symbols, borders and pictures ★ Zoom feature to enlarge screen area for detailed editing ★ Reserve screen to save your design and restore after a mistake ★ Proportional fonts ★ Mirror image ★ Inverse ★ Full range of drawing options ★ Advanced printer routines to accurately position your print out.

ARTROOM for the Master 128 or Compact is supplied on disc, plus 43 page operating manual.

DIGIMOUSE with **GRAFIK** & pointer routines for BBC B/B+, Master 128 or Compact.	**£39.90**
DIGIMOUSE with **ARTROOM** for BBC Master 128 or Compact (disc)	**£59.90**
CHAUFFEUR for BBC B/B+, Master 128 or Compact (disc)	**£9.90**
BBC B/B+ users who do not have Sideways RAM fitted may purchase Chauffeur disc complete with RAM card for.	**£24.90**

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By cheque or access or official educational order direct from Nidd Valley. Or ask at your local computer shop. **Please state for which model computer.** Allow 14 days delivery (we aim to complete within 7 days). All prices include VAT, post & packing.
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12 MONTH GUARANTEE

ACORNUSER

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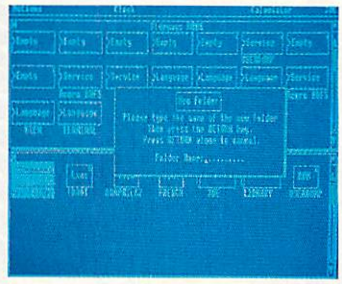
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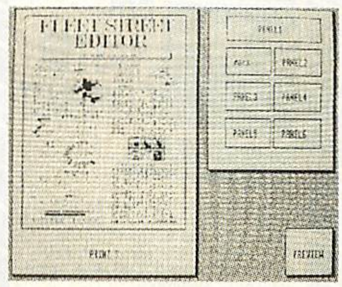
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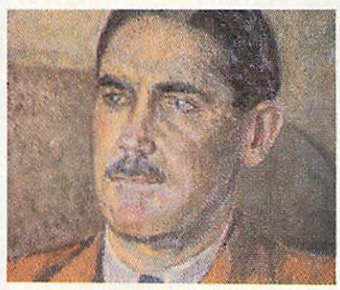
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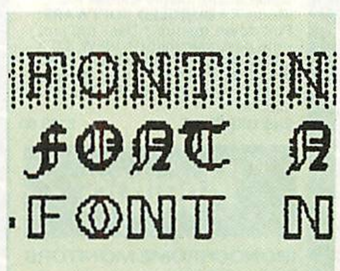
ABC
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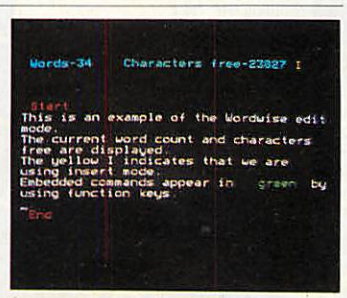
FEATURES











COVER



Illustration by Barbara Bellingham

NEXT MONTH

Communications special issue: software round-up, modem reviews, electronic mail. Also special characters in *InterWord*; and the Domesday System

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Computers

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Complete With Internal Software	£420.00
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Master 512 Upgrade	£217.35

The Master 512 upgrade board incorporates the Intel 80186 processor, plus 512K bytes of RAM. Digital Research DOS+, which is copatible with both MS/DOS version 2, and CP/M 86, allows you to run a large proportion of the most useful programs available. A dual 80 track disc drive is required to run programs on the 512. Provided free with 512 upgrade board are three GEM packages, GEM Desk Top, GEM Write, GEM Paint.

NEW

UNIVERSAL SECOND PROCESSOR
This allows you to connect co-processor boards designed for the Master Series to your BBC Models B or B+. Fitting a Turbo board boosts the BBC's already rapid performance to twice the speed of the standard processor. Fitting the 512 co-processor converts the BBC micro into a 16 bit machine, opening up new possibilities within the world of MS-DOS and CP/M 86. £86.25

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Reference Manual Part I	£14.95
Reference Manual Part 2	£14.95
Acorn Prestel Adaptor	£125.00
Acorn Teletext Receiver	£135.00

NEW

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FILESTORE EO1	£952.00
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Econet Upgrade Kit	£49.00
DNFS ROM	£20.00

NEW

MASTER COMPACT LANGUAGES
Comal, Lisp, Iso-Pascal and Micro-Prolog are now available for use on the MAster 128 and the Master Compact.

COMAL	£49.85
LISP	£29.95
ISO-PASCAL	£69.00
MICRO-PROLOG	£79.95

WORD PROCESSING SPECIAL PACKAGE

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Based on Master 128. The Twillstar All in One Word Processing Package contains a Master 128, View 3.0, Viewsheet, High Res Green Monitor, 800K Dual Drives with PSU, Quendata Daisy Wheel Printer together with a box of Discs, Paper, and all the Cables. **£899.00**

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Based on Master Compact 128. The Twillstar package includes Compact 128, latest version of the View Word processor, single 640K disk drive, monochrome monitor, correspondence quality printer. All connecting cables for above and also 5 disks and some paper. **£635.00**



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Twillstar continues to offer the MASTER COMPACT for your Home Education and Business needs! Complete with bundled software and an integral 3.5" Disk Drive in the following Systems:-

SYSTEM 1 (inc. VAT) **£414.00**
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SPECIFICATIONS: ★ Compatible with Master Series micro subset ★ 128K RAM inc 64K sideways RAM ★ 64K ROM inc 32K MOS, 16K BASIC ★ Up to 4 internal ROM sockets ★ 3.5" 640K formatted disk drive ★ OUTPUTS: Video/RGB/Printer/ Mouse or Joystick ★ Disk drive ★ (optional) Econet ★ Serial ★ 5V power from disk drive module ★ Usual 8 BBC disply modes inc. Mode 7 ★**BUNDLED SOFTWARE:** Pull down menus * Desk top inc. note pad, calculator * VIEW 3.0 * CARD INDEX * Full LOGO * BBC BASIC 4.0 * ADFS + Utils * Welcome suite * Tutorials * (1770 DFS under licence)

2nd DRIVE KIT **£113.00**

Monitors

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Phillips BM 7522 Amber Screen	£95.00
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Hantarex H x 12 Dark Gloss Screen high resolution monochrome monitor 12" Composite Video & Audio input **£75.00**

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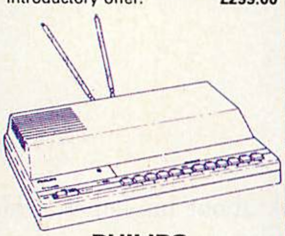
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Microvitec 1441 Hi Res	£391.00
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Phillips CM 8533 Med Res monitor with dark glass etched screen composite video input RGB and Audio Input. **£289.00**

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12" RGB High resolution colour monitor. Fully compatable with IBM, Apple, BBC and most other Personal Computers. 635 x 312 line resolution. Positive or negative sync input. Text colour switchable to green, amber, white or blue or inverse white. Super high contrast tube. Optional tilt-swivel base (with clock/calendar available). Special introductory offer. **£299.00**

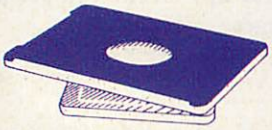


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Mitsubishi 1404 Medium Resolution Monitor with 640 X 200 Pixels RGB available with IBM or BBC Leads. **£229.00**



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MITSUBISHI DISC DRIVES
User Friendly Disk Drives 100% BBC compatible slimline disc drives. All drives are supplied complete with formatting diskette, comprehensive users manual and all necessary cables. All drives are 40/80 Track switchable at the front and have two years warranty.

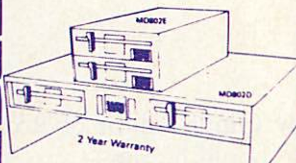
5¼" Drives without P.S.U.

MD 400A Single 400K Double Sided	£118.00
MD 802C Dual 400K Double Sided	£219.00

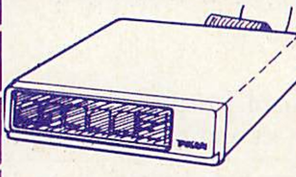
5¼" Drives with P.S.U.

MD 400B Single 400K Double Sided	£135.00
MD 802E Dual 400K Double Sided	£249.00

SPECIAL
MD 802D Dual 400K Drives horizontally mounted in a monitor stand to fit both the BBC B and the Master series. **£269.00**



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Now available
Taxan Multipurpose Type Printer Buffer KIF-4308 compatible with any Centronics interface printer **£149.00**

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NEW

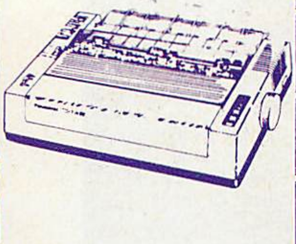
MASTER OVERVIEW
This package allows Master 128 owners (who already benefit from VIEW and Viewsheet) to add the rest of the VIEW family with the purchase of only one package. Overview is a sophisticated combination of ViewSpell and ViewStore on ROM Cartridge and ViewPlot, ViewIndex and Printer Driver Generator on Disk.
MASTER OVERVIEW **£98.90**

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Printers

NEW PANASONIC NEW

Panasonic KX-P1081 Just released the faster and enhanced KX-P1081. 120 cps in draft mode. 24 cps in NLQ mode. Fully Epson RX80 and IBM Matrix and Graphics Printers compatible. Standard friction and tractor feed. Operator accesible print mode switch. Standard 8 bit parallel interface. RS232 interface is optional **£179.00**



Juki 5510
- Gives you 180 CPS & NLQ Standards £269.00

...and thats not all! The Juki 5510 also has full graphics mode, two position 'dip-switch' (providing instant compatibility with both the Epson and the IBM Graphic Printer). Standard 2K memory (expandable to 14K) built-in Parallel Centronics interface and 8-switch international character sets. If you need colour too, the optional Juki 5510 Colour Kit gives you seven colours. **£112.00**

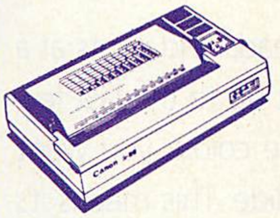
EPSON PRINTERS

Epson FX 800 and FX 1000 range offers superior printing and technical features. 200 cps in draft and 40 cps in NLQ. Complete with tractor and friction feed as standard. Offering IBM compatibility, full graphics. Also includes two NLQ fonts, 10,12,17 and 20 cpi, double height and double width with 8K buffer built in.

FX 800	£369.00
FX 1000	£499.00
FX 800 Sheetfeeder	£141.00
FX 1000 Sheetfeeder	£163.00

Epson EX 800/1000 High speed printers. 300 cps in 12 cpi mode. Also offers four colour printing.

EX 800	£465.00
EX 1000	£626.75
Colour option for both	£62.00



CANON 55A

Wide version. Fully IBM compatible. **£399.00**

CANON PW1080A

80 column printer with 160 cps draft and 40 cps NLQ with built in friction and tractor feed. Fully compatible with Epson FX80. Standard parallel interface. **£249.00**

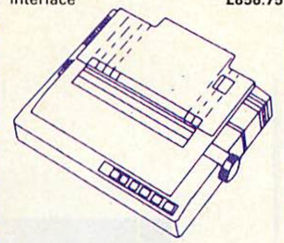
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In house service department Repairs for computer printers and disk drives. Call 01-574 5271 and ask for our engineering depatment.

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STAR NB15

Outstanding print quality at 300 cps in draft mode and immaculate 24 pin Letter Quality at 100 cps. Fully featured front control panel. Centronics parallel or RS232 serial interface **£856.75**



STAR NL-10

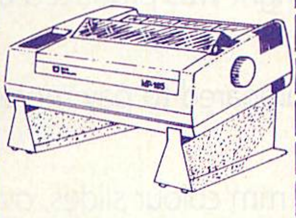
Fine Near-Letter-Quality, 100% compatibility and total reliability all in one easy to use printer. For quality, ease of operation and dependability, nothing beats the Star NL-10. You get outstanding print quality at 120 cps in draft mode and 30 cps in near letter quality. Plus, the sleek NL-10 offers full compatibility with most popular computers through plug in interface cartridges. Just insert the appropriate plug in interface cartridge for your IBM-PC, Commodore, Apple IIc or other parallel computer and your Star NL-10 is ready to print. Touch a button on the control panel to set the print pitch (3 choices), to select the typeface and to print in either draft or NLQ mode. You can even set left and right margins, make top of form settings and control forward and reverse feed in the smallest pitch. **£229.00**

STAR NX-15

Same as Star NL-10 but with 136 column width. Both Epson and IBM compatible **£399.00**

MP200

200 cps in draft. 40 cps in NLQ mode. 7K buffer as standard (128 downloadable characters in NLQ) optional 8K memory. IC font cards. Auto insert–Loads paper automatically to top of form. User friendly control panel–easy print pitch selection. I/F board–quick change of interface to match applications. Cut sheet feeder (optional double bin auto sheet feeder). IBM compatible. **£274.85**

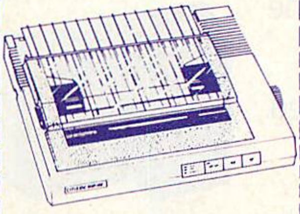


MP201

Same as MP200 with 136 columns **£318.55**

MICRO P MP165

80 Columns. 165 cps in draft mode. 35 cps in NLQ mode. Ultra high resolution graphics. Friction and traction feed. Compatible with all major micros. Quiet and easy to use. 2 Year warranty. Epson or IBM compatible control codes. **£199.00**

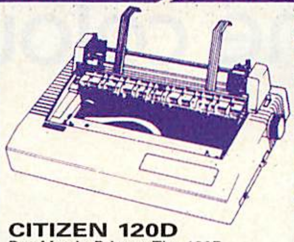


CITIZEN MSPIOE

The new MSPIO with 160 CPS Draft and 40 CPS NLQ. With TWO years Warranty **£269.00**

CITIZEN MSP-15E

17" Wide carriage . 136 column, operating at 160 cps and at the push of a switch will print near letter quality at 40 cps. Fully Epson and IBM compatible. 8k of standard buffer built in. Standard Centronics are optional RS232 **£379.00**

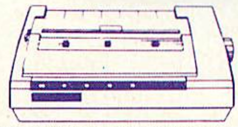


CITIZEN 120D

Dot Matrix Printer. The 120D precision printer brings to the small business, educational and home user good quality and attention to detail. Its compact size, host of standard features and built in quality and reliability that supports Citizen's unique **full TWO-YEAR warranty** make it a must for all computer users. Fast draft output: 120 cps. Built-in NLQ: 25 cps. IBM and Epson compatible. Plug-in interface cartridge. Tractor and friction feed as standard. Optional cut sheet feeder. **£179.00**

SOURCE
The Complete Solution

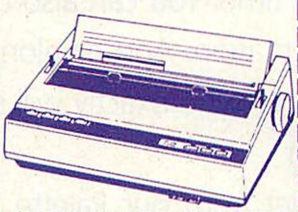
INTRODUCES THE NEW TECO VP1814



Dot matrix printer. VP1814 is fast highly reliable and easy to operate.
- ☆ Standard 80 column
- ☆The high-speed, low energy consumption 9 wire dot head gives printing speed of 189 cps and NLQ speed 36 cps
- ☆Bi-directional, Logic seeking in text mode
- ☆The use of fan-fold, roll or cut-sheet paper is possible with adjustable sproket pin feed and friction feed
- ☆Offers emphasized, double print, super script, sub script
- ☆Justified print mode are also available including left, centre, right and full justification
- ☆9 graphic modes are available
- ☆Both download and inprint buffer can exist simultaneously
- ☆7K input buffer standard can be expanded to 15K
- ☆Printing modes selectable at front panel (NLQ/draft, Pica/Elite, enlarge, emphasize, condense, italic
- ☆11 Language international character font is internalized
- ☆Both IBM and Epson compatable

MAIN UK DISTRIBUTOR
SPECIAL INTRODUCTORY PRICE (inc. VAT) **£229.00**

DAISYWHEEL



PANASONIC KX-P3131

A Fully Formed Serial Impact Daisywheel printer with print speed of 17cps. Diablo compatible print wheels. Print pitches available are: 10, 12, 15 and proportional spacing. Standard friction feed and optional tractor. Paper width 13.5 inches. Standard Centronics optional RS-232C. Built with 6K text buffer expandable to 32K buffer. **£289.00**

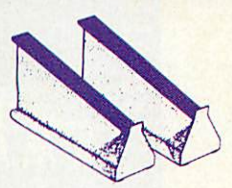
BROTHER HR 20

The new Brother Daisywheel HR 20 8K standard buffer upgradable to 16k. Comes standard with serial and parallel port **£389.00**

DAISYWHEEL PRINTERS

QUENDATA DWP 1120 with optional tractor/sheet feeder and 13" paper width facility. This Daisywheel printer with 20 CPS has 96 character printwheel compatible with the QUME. Standard centronics interface.

(optional RS232 C)	£169.00
Juki 6100	£299.00
Juki 2200	£275.00
Juki 6300	£799.00



PRINTER STAND

Fits nearly any width of printer. Allows paper storage and gives ideal viewing position. Can also be used for computers and monitors. Steel construction prevents bending or buckling **£18.00**

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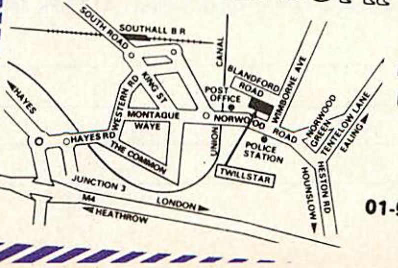
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NEWS

News in brief

■ The demand for *Repton 2* and *Castle Quest* maps took us a little by surprise. We've now received about 400 requests! Maps are obviously popular, so watch out for more, covering *Ravenskull* and *Xor*.

■ Thank you to all those people who have sent in reader survey forms from the May issue. There's still time to win the Compact. The forms should reach us by May 25th.

■ Acorn's RISC chip has a rival produced by Advanced Micro Devices (AMD) in the US. No specific applications have been announced yet, but it's likely the chip will be used in professional graphics.

■ Nidd Valley has released utility software for its mouse. *Chauffeur* allows the Digimouse to be used in place of the cursor keys. The software is supplied as a ROM image for use in sideways RAM for £9.90. Contact: Nidd Valley on (0937) 844661.

BBC take Flight



Flight Electronics has adapted its 68000 processor board so that it can be controlled by a BBC micro via the serial port.

The 68000 is at the heart of the Apple Macintosh and Atari micros. The Flight board, which can stand-alone, comes with a cross-assembler and control software.

Details from Flight Electronics on (0703) 229041.

RISC machine is next BBC micro

By Steve Mansfield

The almost mythical Acorn RISC computer will be the next BBC micro.

Acorn is set to officially announce the micro — or micros — in June, although it may be some time after that before they start delivering. But industry sources say the the BBC has already agreed to put its name on the product.

The 32-bit reduced instruction set computer (RISC) and support chips has been the main thrust of Acorn's development over the past couple of years. The company has already produced a development system based on the chip, and VTI in the US has been selling the main chip set to hardware developers.

The RISC approach, where the main processor has fewer instructions but can carry them out at very high speed, allows much faster and more powerful computers to be designed than the conventional chip design.

It looks as though Acorn may introduce two machines. They are known within the company as the A1 and A500, with 1Mb and 512k RAM.



New micro on Micro Live

The machines will have a heavy graphics bias, as with Commodore's Amiga. Screen resolution is expected to be 640 x 512 pixels, with 256 colours on screen at any time, from a palette of 4096.

Sound generation will also be a major feature of the new machine. The quality and facilities are similar to those of synthesiser devices, like the music 500.



T.V. shows prototype

Micro Live ran Basic benchmarks suggest that the machine could be as much as three times faster than RML's new 80386-based Nimbus.

The A1 and A500 will be capable of emulating the BBC micro. Acorn has followed the trend started with the Compact by adopting the ADFS filing system, and the micro will be able to read Compact format discs. The standard disc size is 3.5-inch, and it seems likely that versions with 3.5in 20Mb hard discs will be available.

The new micros will not have the extensive bundled software of the RISC development system.

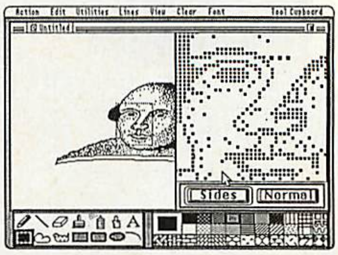
The one language which will be included is BBC Basic — probably version 8. It will run most *Acorn User* listings.

The machine comes at an important time for Acorn. 'Over the past two years we've paid the price of having no 16-bit micro,' said managing director Brian Long.

Quill on the Draw for DTP

The first of a package of integrated desktop publishing programs has been launched by WCS. It is *Quill Draw*, a drawing package controlled by a mouse or tracker ball.

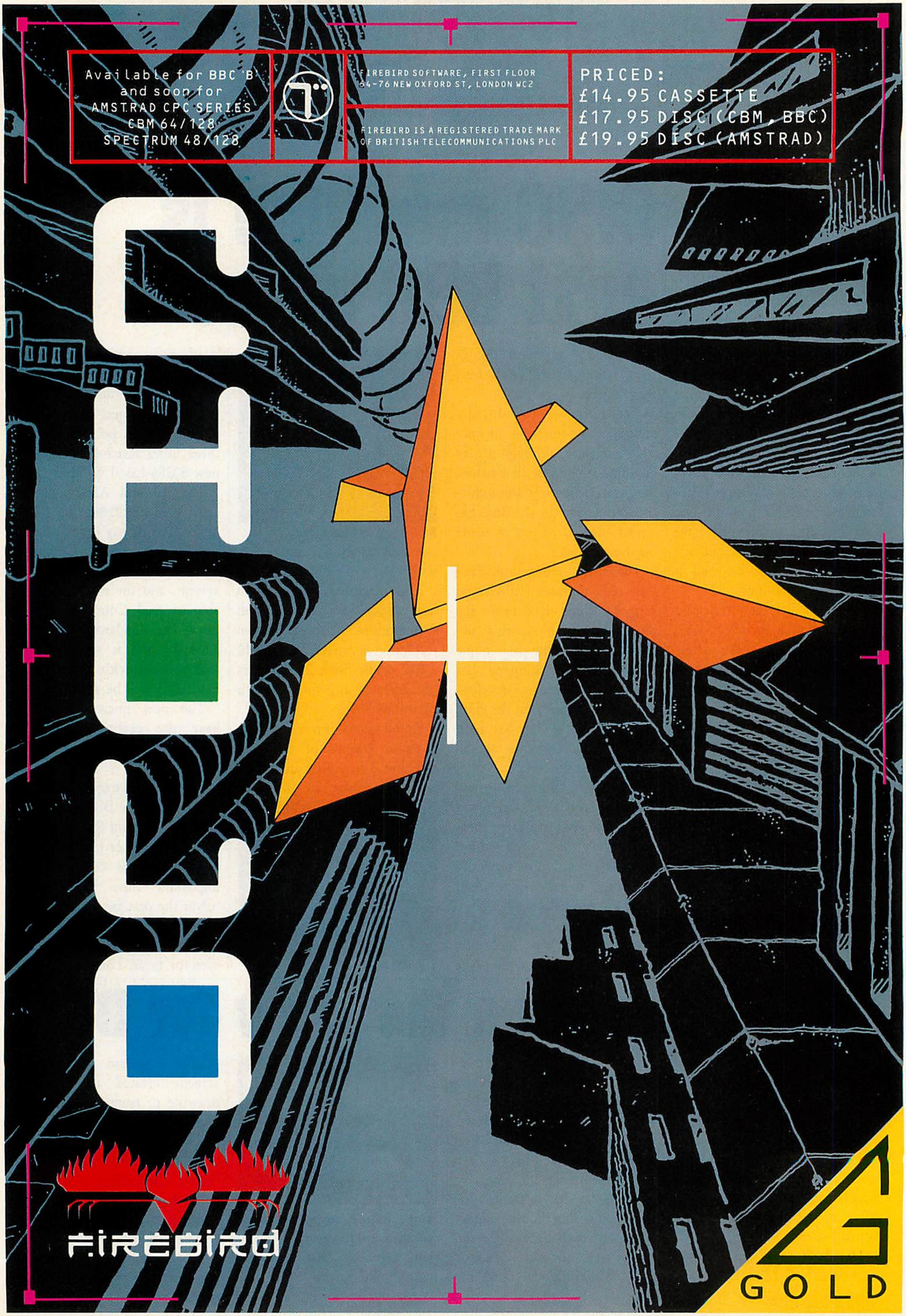
WCS is selling the program, which is disc-based, by itself or packaged with a mouse or Marconi tracker ball. Oddly, the mouse is not the usual AMX or Nidd Valley models but the Apple mouse, as used on the Macintosh. However, the company assure us that the other mice should work.



The program can take screens created using other drawing or painting programs, like AMX Super Art.

Other programs planned include *Quill Translator*, *Quilll Graph*, *Quill Desk Plus* and a number of utility packages.

Prices start at £19.95 for *Quill Draw*, £79.95 if you want it with a tracker ball or £84.95 if you want it with the mouse.


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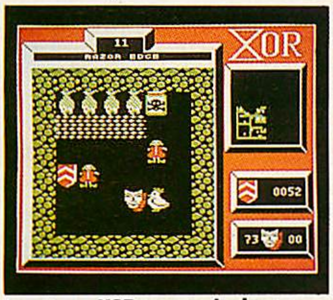
NEWS

Ready for the Show. . .

By Dave Lawrence

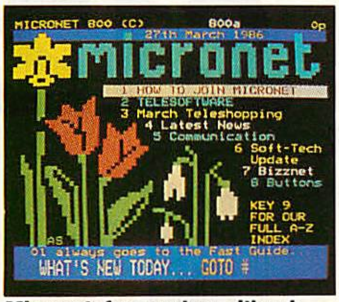
It looks like it's going to be a busy show. The Fifth Acorn User Exhibition, at the Barbican Exhibition Halls from 23 to 26 July, will include special seminars, and all the top suppliers for Acorn computers will be there, many of them with new products.

It's not yet certain whether Acorn will be unveiling its RISC-based micro at the show, but RISC will definitely be the main talking point. Minerva, which produces the System Delta database language, has said that it hopes to show a new database based on RISC technology which, the company claims, 'takes databases beyond the current limits of databases'.



Logotron: *XOR* screen designer

Minerva is also showing utilities to link System Delta to the Computer Concepts *Inter* series, and a fully integrated accounting package. Other points of interest are:



Micronet: free modem with sub

Logotron A screen designer for *XOR*, along with *Pendown Toolbox* – some extensions for *Pendown* and *Printwork*, for mixing text and graphics.

Slogger For Electron owners, Slogger's own Electron disc system, joystick interface and 32k sideways RAM.

Micronet Britain's biggest on-line magazine, carrying daily news, hardware, software and technical features for Beeb owners. You will be able to join at the show for £66 – for a year's subscription, a free modem and software.

Fernleaf Compilations of its educational software for 7-13 year olds and new logic games.

Pineapple A new version of *Diagram* including many new features and the ability to use sideways and shadow RAM.

Computers Concepts The new version of *Spellmaster* on one 128k ROM, along with the latest product in the *Inter* series, the database, *Interbase*.

Electro Music Research The latest MIDI software, featuring a 64-part score writing system and new instrument editors.

Beebug The Master ROM which fills in the gaps in the Master's operating system. Among its features are an ADFS disc formatter, built-in control panel and a RAM disc.

Superior Software All their games will be on sale, including *Crazee Rider* and *Around the World in 40 Screens*.

CJE Microcomputers A new range of fonts for its *Fontaid* and *Multifont* NLQ programs.

Advanced Memory System The usual plethora of AMX software. The latest product is *AMX Design*, a CAD program for designing PCBs, architecture or room layout.

Overbase The award-winning 'Thingi' for holding listings by your monitor. New products include a mouseboard, a printer stand and an IEEE interface.

Twillstar Computers Two new low-cost hard discs, 20Mb and 40Mb, and a new low-cost dot matrix printer.

Permanent Memory Systems PMS's latest product *Genie*, a 'pop-up' diary, calendar and notepad ROM; Master version of NTQ ROM on a 32k chip and PMS's second processors.



PMS: *Genie* diary and notepad

U Music The popular UMI 35 MIDI interface, plus software.

System The new macro assembler and editor, *ADE+*, and *The Music System*.

Vine Micros The new Master version of *Replay*.

Meedmore Distribution Light pens, mice and a new sturdy analogue joystick.

Amcom The latest software for Amcom's e-net network.

Registered data goes public

Some of the information compiled under the Data Protection Act can now be found in your local library. The first 77,000 registrations under the act have been made public, using microfiche – though there are another 55,000 to go.

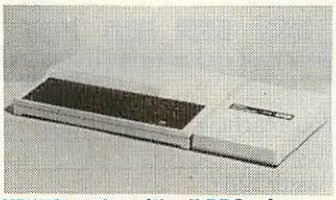
The records simply show who has registered, with some details of the type of information held. But you'll have to wait until 11 November before you have the right to see the information which companies hold on you.

Two more IV systems

Interactive video is the buzz phrase of the moment, and two new systems have been launched in this growth market.

From Interactive Media Resources (IMR) comes a complete tape-based system for under £1000, which includes interfaces, software and a modified Sony video recorder.

The VP170 system processor is a second processor-type box and works with all BBC micros. The software gives extra '*' commands to control the system, and so can be used from any language. The commands allow full random access control of the tape – no tape editing is necessary.


VP170 works with all BBC micros

As a bonus, the system includes video logging software, complete with drop-down menus, windows and icons.

The Companion system from Bevan Technology also uses '*' commands, but can control both VHS tape machines and Philips LaserVision players.

It comes with its own 3.5-inch disc drive mounted in a bridge-type monitor stand. The price starts at £2110 for a laser disc version (including player) and £2550 for the VHS version.

Interestingly, both makers suggest using the Microtext language. IMR can be contacted on (0902) 341854, and Bevan on (0922) 649092.

NEXT MONTH

Next month will see *Acorn User*'s fifth birthday. To celebrate, the theme will follow one of the fastest growing areas of computing – communications.

The telephone system has become one of the most popular peripherals for micros. But hooking up your computer to the phone can be tricky, and deciding what to do once you're online can be confusing. So the July issue contains:

ON THE BOARDS Benjamin Rietti takes a look at bulletin boards, with hints on how to get the most out of them.

EMAIL Steve Mansfield offers suggestions on the best electronic mail system for you.

HARDWARE Reviews of two of the latest modems. The budget Linnet and the state of the art Series 4 are put through their paces.

SOFTWARE A roundup of comms software including *Dialup*, *Modem Master*, *CommSoft* and *Commstar II*.

Q & A Jeff Ashurst answers the most common and perplexing questions about getting started with comms.

PLUS Joe Telford delves into interactive video; Graham Bell produces a graphical page preview utility for *View*; a DFS to ADFS file transfer utility is provided by John Knight; and Brett Laniosh has a useful routine for printing strange characters from *InterWord* and *Wordwise*.

CONTACTS

Acorn Computers: Cambridge Technopark, 645 Newmarket Road, Cambridge CB5 8PD. Tel: (0223) 214411.

Edinburgh Translations: 14 Strafford Street, Edinburgh EH3 7AU. Tel: 031-225 8965.

Interspan Electronic Mail: 108 Mill Road, Cambridge CB1 2BD. Tel: (0223) 316686.

SouthDown Fine Art: 28 Western Road, Hove, Sussex BN3 1AF. Tel: (0273) 723760.

WCS: 26 Windrigg Close, Egremont, Cumbria CA22 2EE. Tel: (0946) 820755.

Overseas sales help Acorn into the black

By Steve Mansfield

Acorn is back in profit. But this success owes a lot to overseas business and the sale of Acorn equipment under other names.

According to managing director Brian Long, the operating profit of £1.4 million was better than expected. Turnover for the second half of the year rose by 38 per cent compared with the first half, making the total turnover for the year £46.7 million.

The company is still heavily committed to research, and Long said he preferred to develop Acorn products rather than follow 'standards'. Around 10 per cent of Acorn's income total was spent on research and development over the past year.

According to Long, Acorn's main strength lies in specialist markets. 'I would rather emulate Apple than Atari or Commodore,' he said. Education is still seen as the main market, and that's where the forthcoming Acorn RISC microcomputers will be targeted.



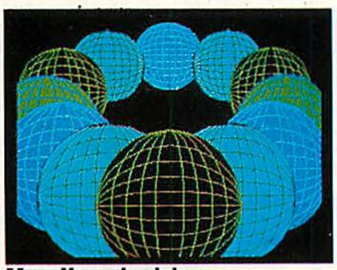
Long: pinning hopes on RISC

OEM (original equipment manufacturer) sales, where Acorn sells equipment which is then rebadged or incorporated into another product, accounted for 10 per cent of turnover. Long wants to double that figure, and the RISC system could play an important part in this.

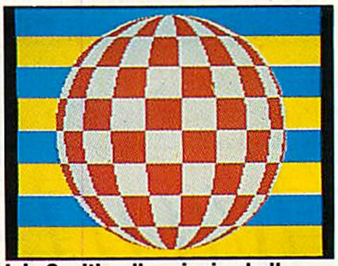
Developing the RISC system has been expensive. Research and development costs for micros launched in 1986 (the Master and Compact) were £1 million. The costs for 1987, which is the year of the RISC machine, were double that. And products for 1988 have also cost Acorn £2 million.

The new micro based on the RISC chip (see lead story, page 7) will the main focus for Acorn over the next year, and the company is pinning a lot of hopes on it.

One-line wonders



Marc Young's globes



Iain Coulthard's spinning ball

We've been gazing at our screens, stunned by the one-line graphics programs you sent in for the March competition.

There is no first prize, but the best program, by a unanimous decision, was the smoothly pulsing water ripples of Duncan Rowland of Bassingham, Lincoln.

Duncan gets a copy of *Mini Office II*, as do the other nine winners: Tim Brown, Milton Keynes; M P Thrope, RAF Cranwell; R Weir, Purley; G R Sanderson, Southall; Gledwyn Jones, Meifod; Jason Sorsby, Rotherham; Marc Young, Tonbridge; J R Greening, Edinburgh; J R Young, Wadhurst.

Finally, a special mention goes to Iain Coulthard of Rustington, West Sussex. His program didn't actually work very well, although we managed to modify it, and it was also too long for a single line. But amended it looks good.

Overnight calls for new email

An electronic mail system which costs you nothing in phone charges has been introduced by Interspan.

The system works by Interspan phoning its clients overnight and 'collecting' all waiting mail and delivering any incoming messages.

When the Overnight program is run, the system tells you how much the mail is going to cost before Interspan's call.

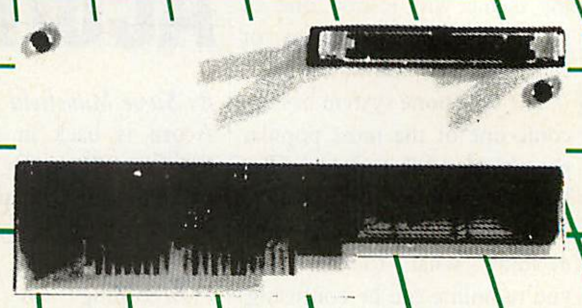
The cost is £50 a year, plus a once-only enrolment fee of £25 and charges on the size of text.

The system is designed to work on the Econet network, and educational establishments can get a special deal for £90 which includes the enrolment fee, a year's subscription and £40-worth of free mail, which is equal to about 20Mb of text.

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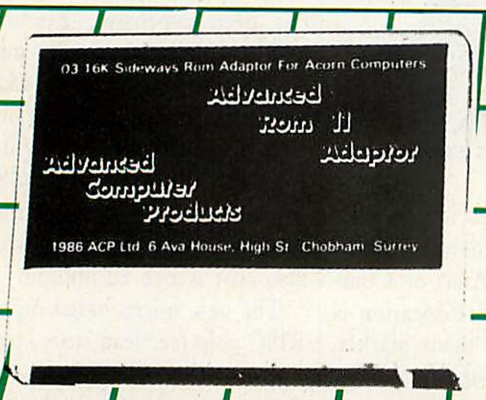
"The AP4 should be considered the standard interface for the Electron".
Acorn User, July '86

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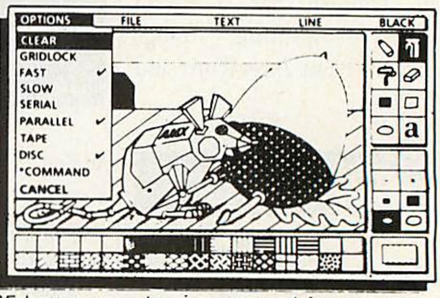
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Included in the package are two superb programs:

AMX ART has to be seen to be believed! It's a computer-aided drawing program that's just as good for serious applications - such as the preparation of detailed architectural and engineering drawings or teachers' worksheets - as it is for having lots of family fun! And if you're artistically inclined, you'll be astonished at the quality of work you can produce and save. It makes full use of on-screen menus, pull-down menus and icons: the ideal, easy way for novices to learn and gain in confidence.

ICON DESIGNER is an invaluable program for creating and storing icons for use in your OWN programs.

The ACP/AMX mouse package may be used on an ELECTRON fitted with a PLUS I & AP5. The 'ART' software is supplied on cassette but can be transferred to DISC (DFS not ADFS)

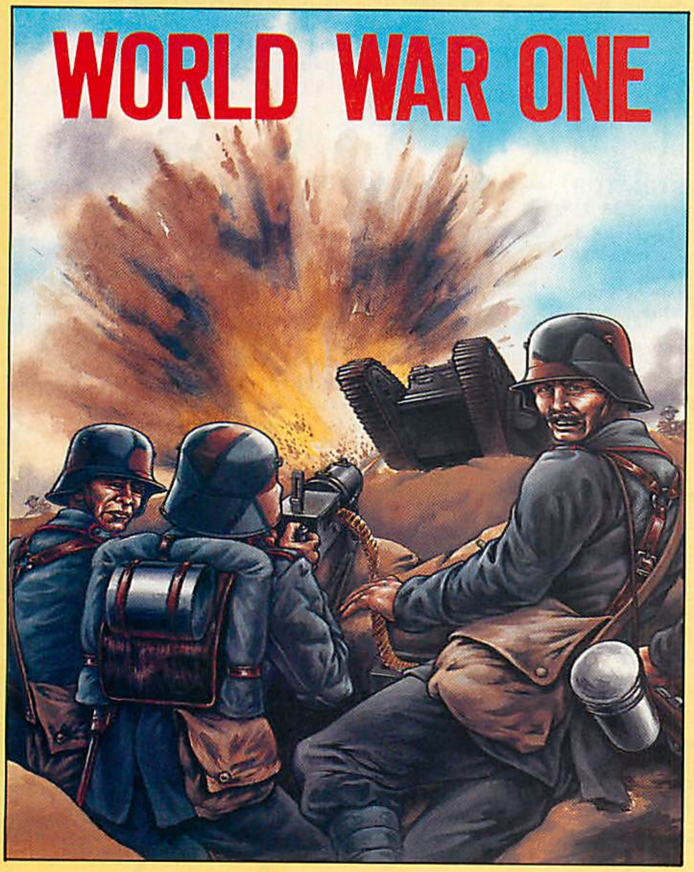
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FROM LOTHLORIEN

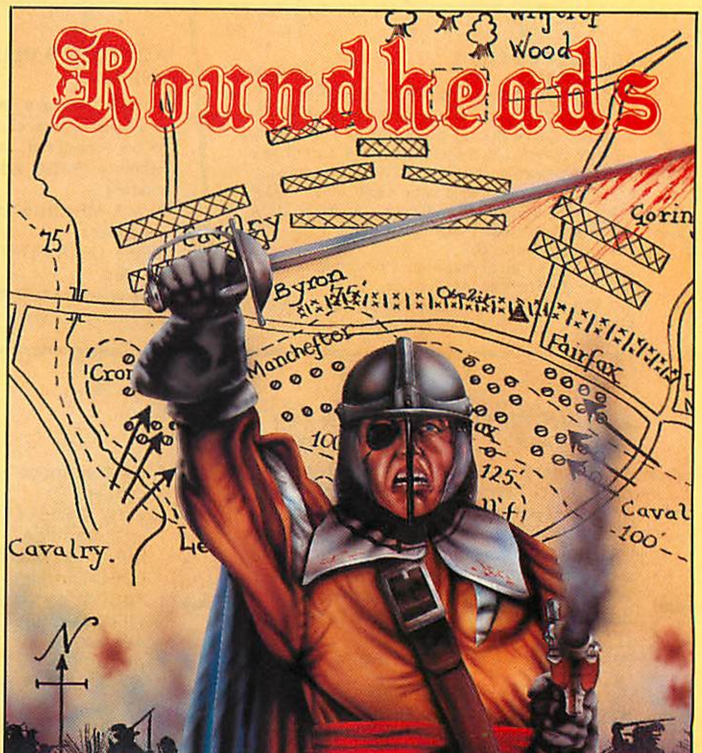
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News in brief

■ The address for the £175 *Hotel Servant* package in the April issue was wrong, and should be: 184 Badminton Road, Downend, Bristol BS16 6NP. Our apologies.

Also, the review of *Menu Master* in that issue was written by Peter Lee, not Benjamin Rietti. Sorry Peter.

■ The British Amateur Electronics Club may well be of interest to those who like wielding soldering irons. The club covers the whole country, and publishes a newsletter, maintains a reference library and organises special deals. Send an sae to: Cyril Bogod, 26 Forrest Road, Penarth, South Glamorgan CF6 2DP.

■ Minerva has added a report utility to its *System Delta* suite. Called *Reporter* and priced at £19.95, the utility allows you to extract data and perform arithmetic. Contact Minerva Systems on (0392) 37756.

■ Acorn User Club Belgium has moved. The Brussels and Videosoft clubs have gone but there are still three, at: Cobdenstraat 19, 2018 Antwerpen; Rue des Clématites 9, 1080 Brussels; and c/o André Macq, Fossés Fleuris 16, 5000 Namur.

It's a business frame-up

By Steve Mansfield.

Next time you're framed there's a good chance that a BBC computer has had something to do with it. Southdown Fine Art has produced an accounts and stock control software package for use by picture framers.

The *Complete Framer's Manager* is designed mainly for keeping track of stock and costing jobs. It lists all the stock that is currently held, as well as telling you what's on order and reminding you to order more when your stocks are getting low.

Southdown is also trying to sell the package as a useful point of sale tool. Jobs can be costed and quotes produced very quickly, and the program gives a complete analysis and breakdown of costs, profit and VAT – a real boon for the self-employed.



Doing a square deal

When you need more materials, the program automatically prints out an order letter to your supplier. A price ticket can also be produced, so long as you have an Epson-compatible printer.

The system works on both the BBC B and Master, though you do need twin double-sided 80 track disc drives. The price is a hefty £517.50, although that probably works out cheaper than having software written to order. The same company has also produced a companion program called *Data Mailshot*, a database which can be used either as an address book or for mailouts. It stores up to 1000 addresses on each disc. The price is £57.50.

Edit in character

Tired of searching in vain for a foreign language text editor with communications facilities? Gordon Thomson decided to write his own.

As a technical translator, he needed to be able to use foreign characters, so 60 of the characters in the *Euro Text and Communications Editor* are user-definable. Complete foreign alphabets can be designed and printed on dot-matrix printers – printer drivers are included.

Text is edited in mode 3 and can be saved or transferred to another computer via a modem using the built-in communications program.

Price of the software is £28.75 and it is available from Edinburgh Translations.

Blunderbox

There were two minor errors in the May issue. First, Joe's Jottings listing 2 in the Yellow Pages, line 850 should read:

```
850 n=INT(2^(INSTR("ds
qcmsb",nm$)-1))
```

Second, the competition clue B across should be:

```
B LDY #202 : INY
```

but crossword addicts probably already spotted that one!

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Please note: debugging readers' programs or those from other magazines is a complex task and we cannot guarantee to give a full solution. Unless the problem can be spotted quickly, the service will only be able to make general comments or suggest a strategy for the reader.

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The Comms Column

■ The comms front has been so quiet recently that I wouldn't be surprised if manufacturers of intelligent modems are considering changing the default 'inactivity timeout' facility on their products.

With my most recent telephone *bill* having been three times normal, I was very interested to hear about the rival system to BT offered by Mercury Communications. The Mercury 2200 service offers much cheaper trunk calls (that's when the telephone number begins with a zero), together with improved call quality. You can obtain more details from Mercury, on 0800 424 194. I shall be explaining more on this exciting new development in next month's issue.

■ Following on from Micronet's 'Introduce a friend and take 10', Microlink is offering existing subscribers £5 off the monthly bill for each new user they introduce to the system, who are also relieved of their first £5 registration fee.

■ Database's *Telelink* magazine has been sold to Marathon Videotex, who recently signed a contract with Prestel to publish the official Prestel directory. The January/February edition was delayed because of the sale, but Marathon has taken over printing, and will be honouring all subscriptions.

■ The much talked-about keyword searching facility is now available on Prestel. You no longer have to key through several sub-indexes to reach the required subject. Just key *KEYWORDS# for details.

■ A new piece of host bulletin board software has been *announced*, and is currently handling many new boards that have sprung up around Scotland. HBBS costs £25 and is compatible with both the BBC model B and Master series. More information on HBBS can be obtained from dialing the author's own BB, on (0274) 42957.

Buzz

Acorn seeks business markets for Domesday

By Steve Mansfield

Acorn is looking to the business world rather than to education to sell its Domesday interactive video system.

The company has appointed about 100 business dealers, in addition to the 20 dealers already catering for the education market. And Marc Shrimpton, dealer sales manager for the Domesday system, expects 80 per cent of sales to be in the business sector.

The new dealers vary widely, from consultancies through to large offices equipment suppliers. Many of them will be using the system as the basis for 'value added reselling' – which means taking a product and adding extra software, training services, maintenance deals and so on.

Vertical market packages for very specific markets have already been produced by the Open University, British Gas, British Rail and Ford, with Acorn's encouragement.

More are expected. 'A major European car manufacturer' is putting its entire spare parts list onto video disc, complete with line drawings, cross-referencing for compatibility and maintenance information. The video disc will be updated every year, with intermediate updates on floppy disc.

The large storage capacity of video discs has also attracted the interest of the Law Society which is considering creating a cross-referenced database of legal precedents.

Interactive video in general is already important in training, so Acorn is also pushing the Domesday system towards this market. A medical diagnostics package is being put together which allows trainee doctors to interrogate the database as if it was a patient. Other software packages being developed include an interactive science laboratory. To promote the use of the Domesday system in business, Acorn is holding seminars for dealers, to show them what the sytstem is capable of and how it can be sold.



Derek Jacobi (right) as Turing, with Dave Hill

Turing triumph

An overheard conversation in the interval sums up the great success of Hugh Whitemore's play *Breaking the Code*, based on the life of mathematician Alan Turing who is often referred to as 'the father of computing'.

Husband: 'Gosh, this Turing chap must have really existed.'

Wife: 'Yes, and isn't it amazing how they can talk about mathematics for five minutes and you can still understand it.'

The play appeals both to theatre-goers who want to see Derek Jacobi and to people who have an interest in mathematics and computing. Turing is best known for his theoretical work in artificial intelligence, but his great achievement was to break the Enigma code used by the Germans in World War Two. Tragically, he was prosecuted as a homosexual and killed himself.

The play's run has been extended at the Theatre Royal in Haymarket, London, until Monday June 13, with extra material added to explain more of the concepts behind breaking the code.

Viewfax goes down for good

The Viewfax database on Prestel has closed down. Although one of the most popular information providers (IPs) on Prestel, the database is now costing the company too much – about £30,000 a year according to some sources.

Parts of the database are still accessible, but no pages are being updated.

Although the Viewfax 258 database was the most visible part of the company, it makes most of its money from hardware sales, including a new networked point of sale system.

Viewfax was the first IP to cater for micro users and pioneered the techniques of telesoftware – allowing people to download software over the telephone line.

As well as its own pages, Viewfax supported to number of sub-IPs, which will now have to find new homes, and discussions have been held with Micronet and Microlink by Benjamin Rietti of Tubelink.

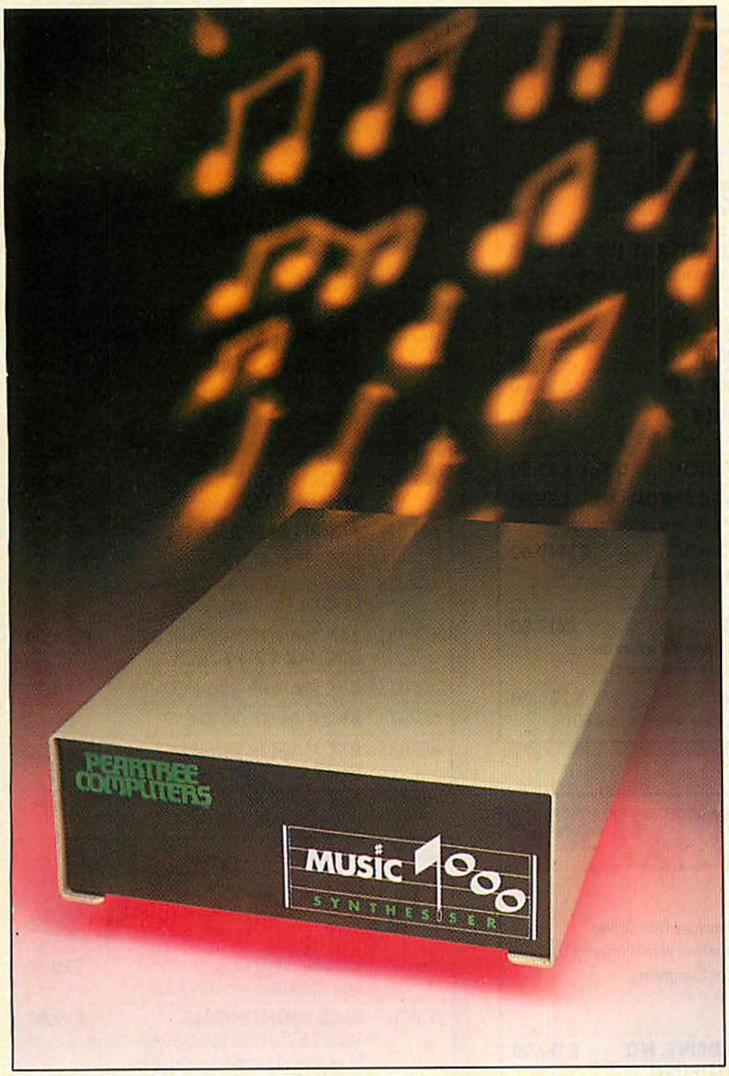
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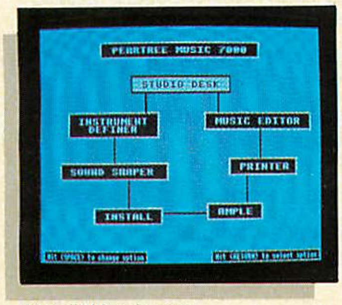
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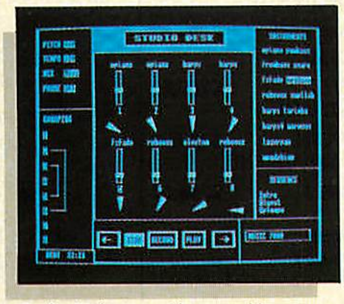
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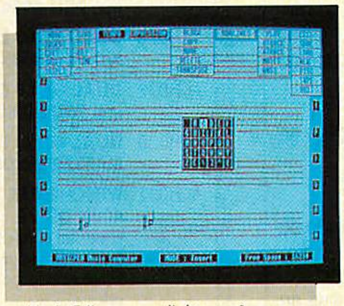
▶ **PEP024**



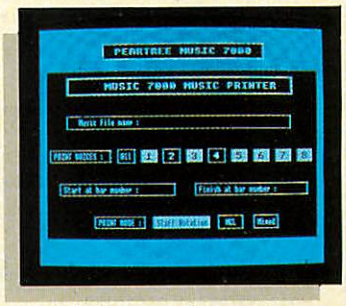
Music 7000 main menu



Studio Desk menu with mouse driven record, play, rewind options



Music Editor menu, light pen & mouse driven with complete menu options at top



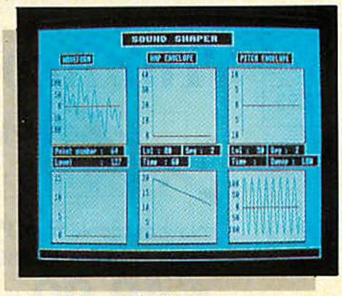
Music Printer menu with many unique features



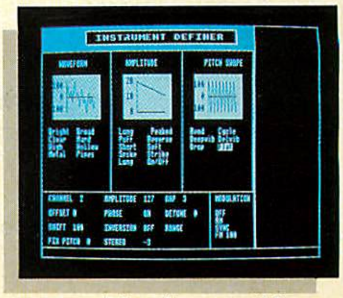
Music 7000 Ample menu



Music 7000 Installation menu allowing you to install your mouse, keyboard, light pen, printer type, colours, etc.



Sound Shaper allowing you to create your own waveforms, envelopes, mouse, lightpen or keyboard driven



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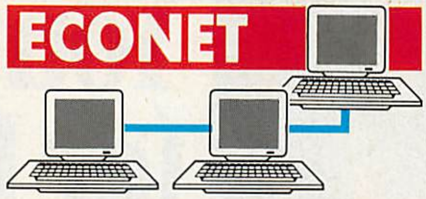
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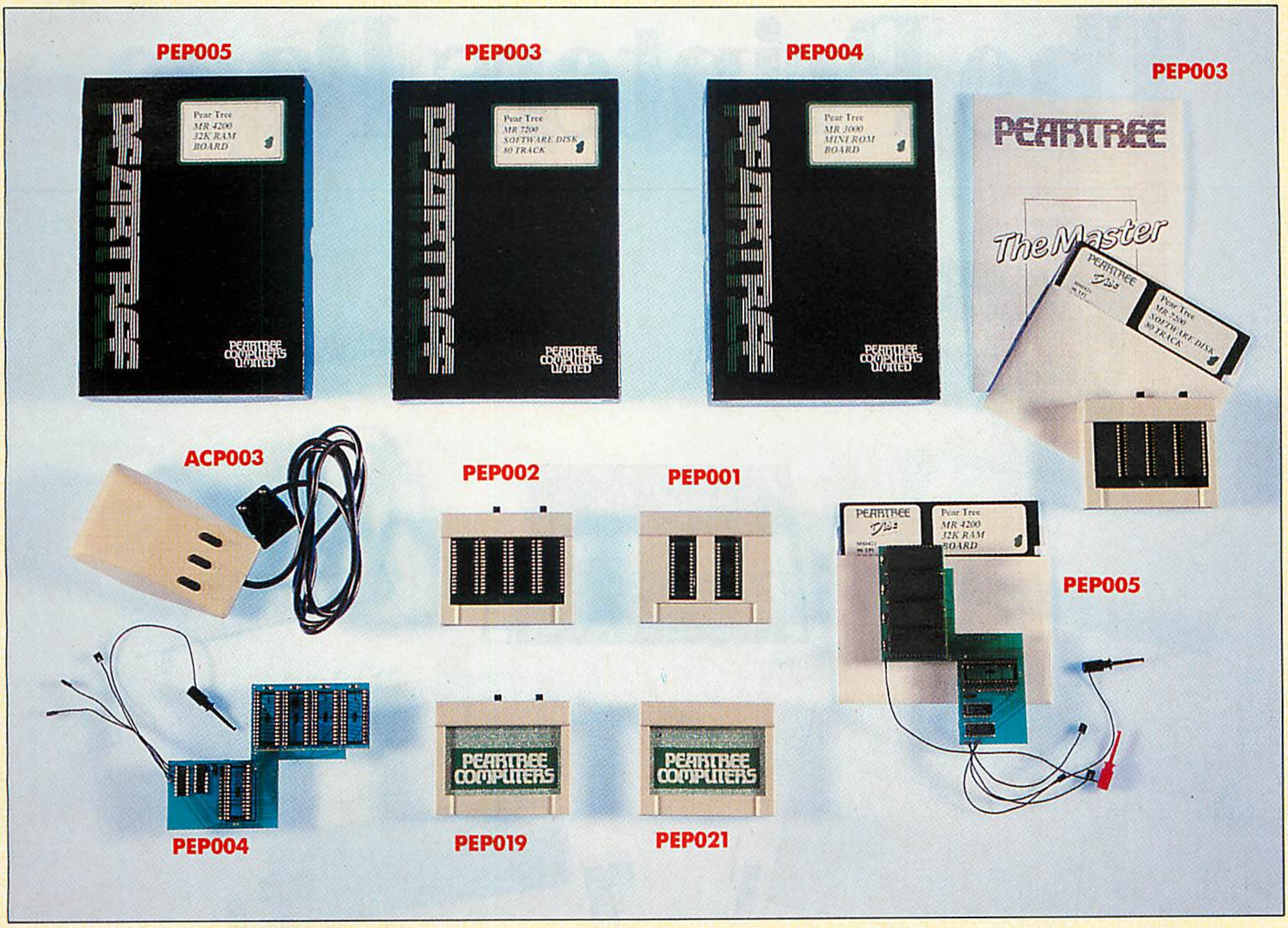
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PEP023	**MR4800 RAM BOARD** RAM board for the BBC Model B 128K RAM Battery backed up Small, easy to fit, complete with utility software Includes write protect switch, battery included	**£59.95**
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PEP006	**PEAR1 MASTER 128+FX80+** Acorn Master 128 Epson FX80+	**£570.00**
PEP007	**PEAR2 MASTER 128 +DRIVE+FX80+** Acorn Master 128 Epson FX80+ 800K twin disc drive in bridge for the Master	**£835.00**
PEP008	**PEAR3 MASTER 128 GREEN MONITOR FX80+ PRINTER DISC DRIVE** Acorn Master 128 Epson FX80+ 800K twin disc drive in bridge for the Master High res green monitor	**£895.00**
PEP009	**PEAR4 MASTER 128 COLOUR MONITOR FX80+ PRINTER DISC DRIVE** Acorn Master 128 Epson FX80+ 800K twin disc drive in bridge for the Master Medium to high resolution RGB monitor with video output	**£1025.00**
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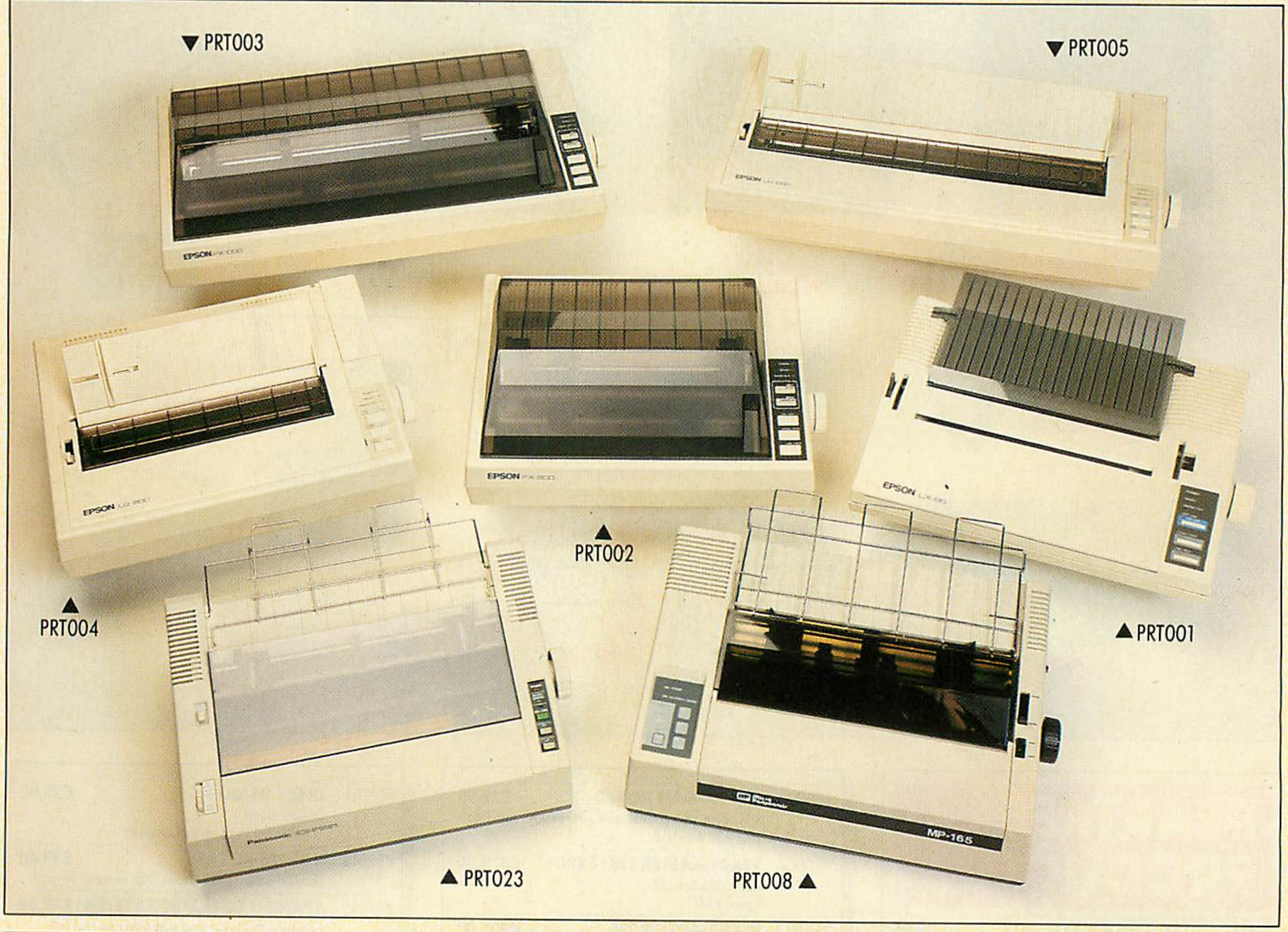
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The Printers Page



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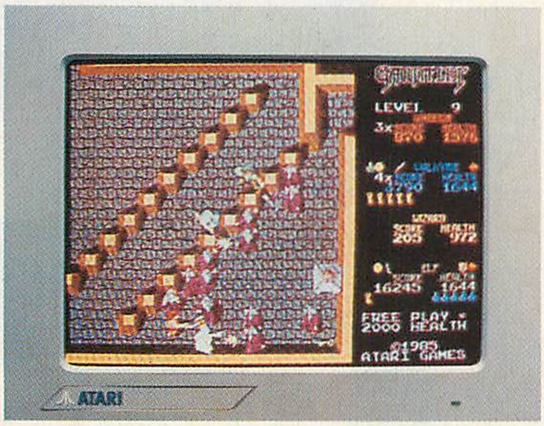
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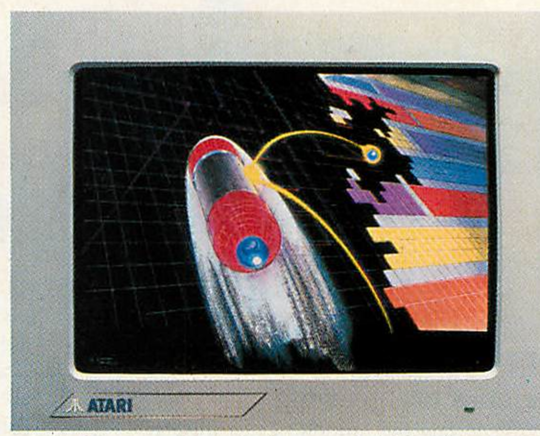
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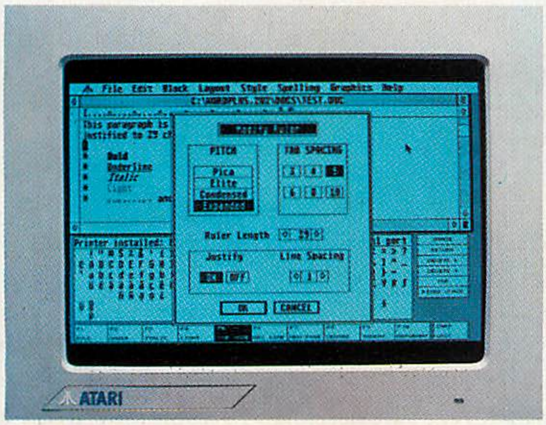


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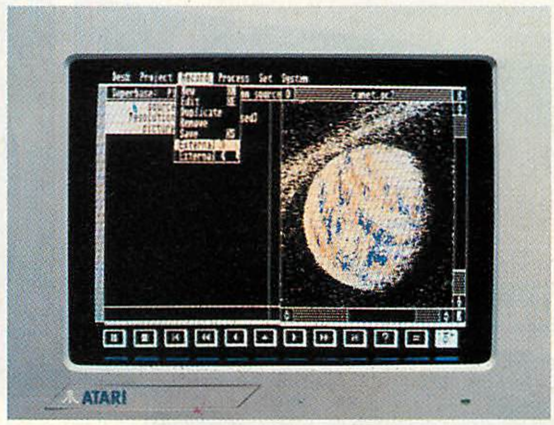


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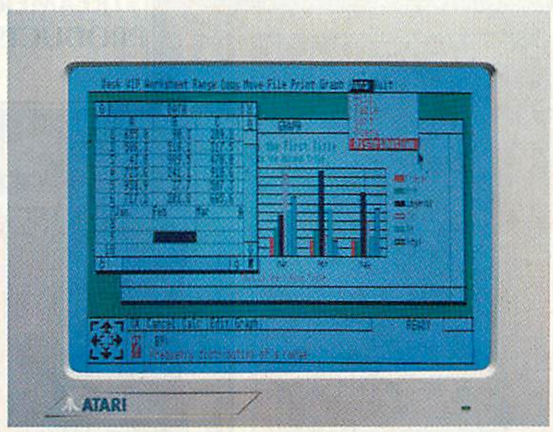
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ATARI 520 ST

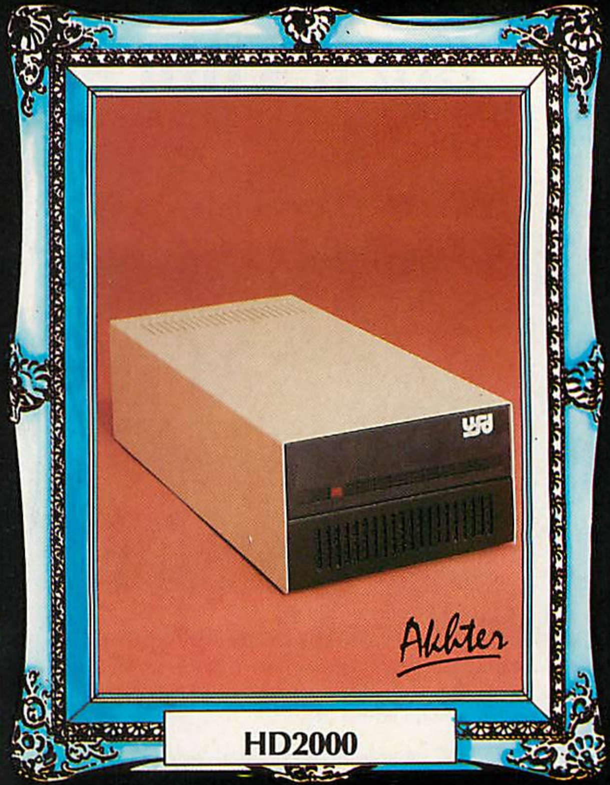
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*Screenshots are from the original Arcade game.

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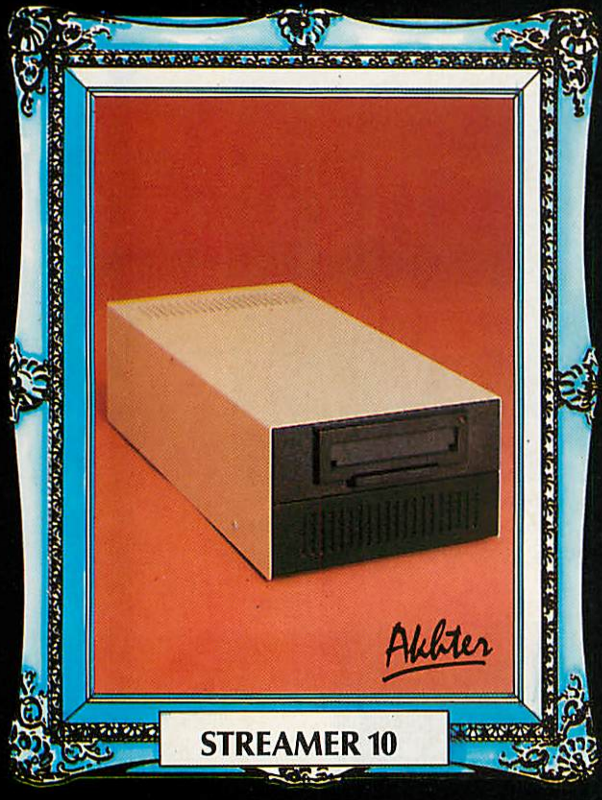


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*These units are mounted in a plynth suitable for the Acorn Master 128 Series and includes Power supply units.

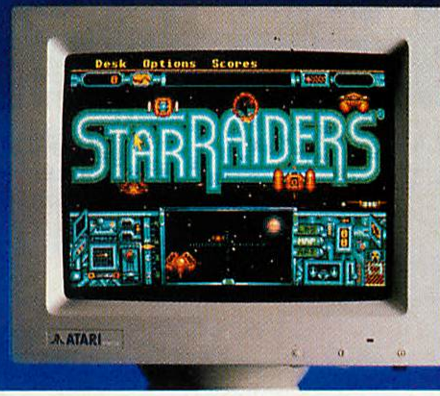
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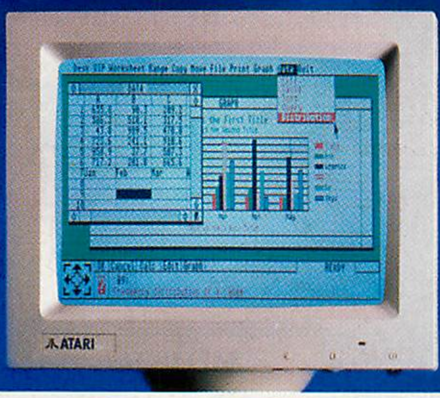
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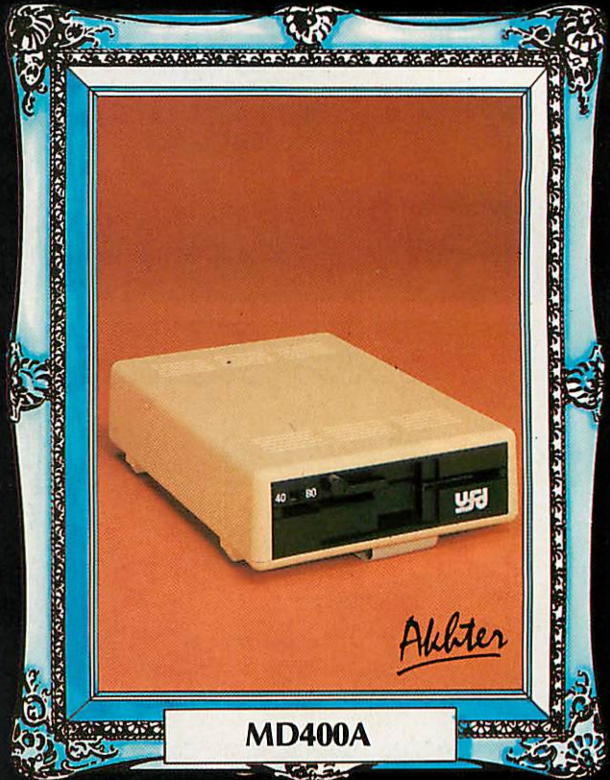
*Offer includes mono monitor. The 520STM plugs into a standard colour T.V.

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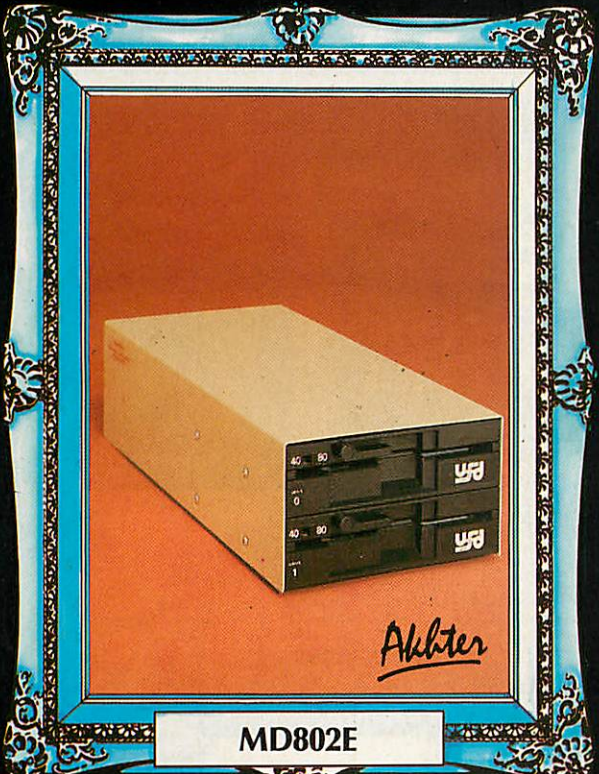


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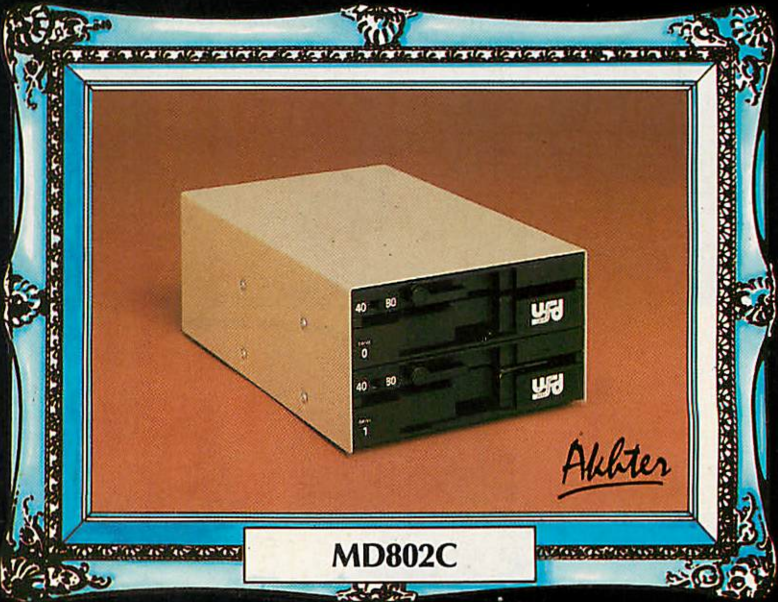
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	HR15 Corr	£2.90	£2.50	£2.30
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	HR15 also for HR25/HR35			
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	802/1526	£3.70	£2.90	£2.70
	803	£3.40	£2.90	£2.70
	MPS1000	£2.70	£2.30	£2.10
	4022	£2.70	£2.30	£2.10
	MSC801 Colour. One Off			£18.50
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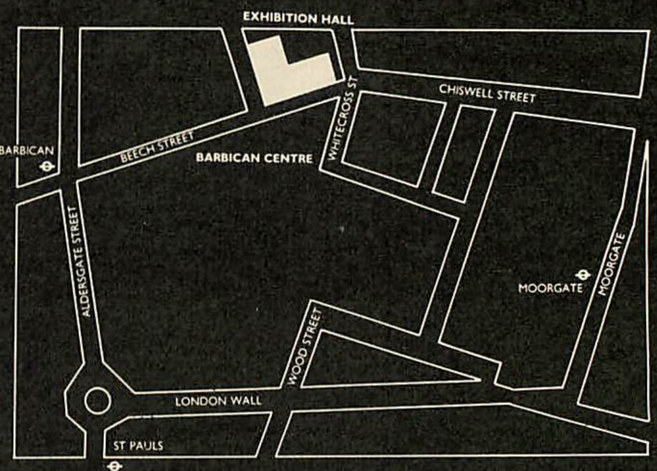
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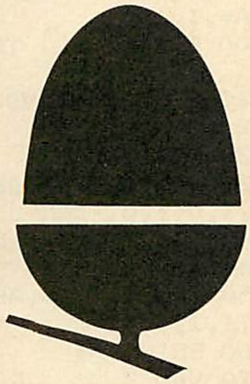
LETTERS

Write to Letters, Acorn User, 141-143 Drury Lane, London WC2B 5TF

ACORN SHARES FOR USERS

Sir, Acorn's results were announced at the end of March and the financial recovery was spectacular at first glance, causing the share price to jump into the eighties, until reflection suggested that the earnings per share made them far too expensive at that level. The general fall in the market and a widespread mistrust of Acorn's statements have contributed to the prices returning more or less to square one.

It occurs to me that if readers held a few Acorn shares, say to



the value of a decent disc drive, it could be a formidable defence against Olivetti deciding to sell out – and all your readers must surely be anxious to see Acorn prosper. As you know, among other perks, shareholders in Ladbrokes receive a 7.5% discount on electronic equipment in the Lasky stores. Perhaps you would care to propose a similar 'discount' scheme to Acorn to promote interest in their shares and their products. A returned holding of something like 500 shares for individuals and 5000 for dealers might be about right.

Michael Leete
Manchester

TWIN KINGDOM SOLUTION

Sir, In answer to Jack Wasey's question regarding *Twin Kingdom Valley*. Give the forest king's guard the diamond found in the case by waters meet. To receive the silver key return to the forest king after freeing the princess from the dungeon, but you must be wearing the bracelet (given to you on the first visit to the forest king) when freeing her, so that she can recognise you.

C H Yatt
Hants

ACOUSTIC COUPLER QUESTION

Sir, I recently bought a Sendata Series 700 acoustic coupler (Telecom C81/8/548) manufactured by Electro-Med of Armadale, Australia. This item was purchased at an auction held because of the liquidation of a local Apple-only dealer and appears brand new.

Unfortunately, the item was sold without any instructions whatsoever and the lead to the computer terminates in an eight-pin DIN plug (only six pins used), which of course does not fit my BBC model B serial input port. There is also a switch on the mouth-piece suction-cup marked 300 BPS answer/300 BPS originate and a 3.5mm jack socket in the ear-piece which I suspect is the power supply input socket, although no input voltage is actually specified.

I am quite able to resolder the DIN plug if I knew what wires to solder to what pins and I have a variable power supply that I can use to power the coupler if I knew what voltage to provide.

It would be most helpful if you could provide the answers for these queries and supply me the address of Electro-Med's distributor. Can readers help?

J Colin R Hunter
Edinburgh

VIEWSTORE REPORT FORMAT

Sir, I am a keen user of Acornsoft's *ViewStore* database package, but I found that there seemed to be a serious disadvantage with the 'report' mode. The problem is that there is no provision for making substantial changes to a report format, other than adding items at the end, once it has been set up.

Recently, I was faced with retyping a report because two lines were needed in the middle of it, and when I grumbled about this to my son he asked 'Would a wordprocessor help?' *View* refused to load the file, but the Master editor allowed me to insert the two lines into the middle of the report, and then make other text changes.

Further research showed that is necessary, but I like it less *Wordwise +* will also do what than the editor because of the forty character lines, and the fact that all 'unprintable' characters are shown identically.

David H Wild
Herts

In fact *View* will READ *Viewstore* report format files. They can be edited and resaved, but IMPORT must be used to get the file back into *Viewstore*.

MODEL B MODEM MAKE

In the near future I intend to buy a modem for my BBC model B. Can you explain to me what is meant by 'Hayes compatible' and whether this would be of any advantage to a home micro user.

J Shipp
West Sussex

Hayes is an American manufacturer of modems. Some modems can respond to commands from the computer (eg, to dial a number). Hayes has developed a standard range of commands, and many other manufacturers (Pace, Miracle) have followed their lead. The Hayes commands are the modem equivalent of Epson control codes for printers.

Some of the terminal software for the BBC now takes advantage of the Hayes commands, for example Modem Master from BBC Soft. Next month *AU* will cover communications including modems and comms software, and what they do, in more detail.

UPGRADE PROBLEM

Sirs, Since I bought *Beebed*, a full screen Basic program editor, from the authors, J & O Software, 38 Hadden Way, Greenford, Middlesex, shortly after publication, it has undoubtedly been software piece number one inside my Beeb.

I wonder how many Basic programmers use it now and whether they feel about it as I do. It has provided me with the perfect tool for long hours of both pleasant and efficient programming in Basic. It is certainly a remarkable piece of software for a chip of only 8k. I have recently upgraded to a powerful Master where *Beebed* refuses to function.

Letters to J & O Software at the above address to request a new version for the Master received no reply. Other enquiries have only given the hint that *Beebed* was sold by the copyright holders, O Blackburn and J M Nuttall, to an unknown software house to be included inside a bigger chip.

Can anyone provide more information about a new Master version of *Beebed*?

I Bengoechea
Santa Cruz de Tenerife

REVIVIS ALTERATION

Sir, The following alteration to Tessie Revivis' 'T2D' program, yellow pages, *AU*, May 1986, will greatly facilitate the successful transfer of machine-code programs which have to be located and executed at particular addresses (not necessarily the same):

```
310 PROCoscli("SAV
E "+LEFT$(i$,7)+" "+
STR$~mem%+" +"+MID$(
i$,15,4)+" "+MID$(i$
,36,4)+" "+MID$(i$,2
7,4))
```

Without the above alteration 'T2D' saves files to disc from an 'enforced' *LOAD address (mem%) which avoids corrupting the transfer program. This however means that any mc-files subsequently run will load and execute at this address and not at their correct load and execution addresses, thus they will crash.

P J Peugniez
Northumberland

MUD MAN RESPONDS

Sir, I'd like to make a few comments with reference to Peter Voke's article in your April issue, which compares our multi-user adventure game *MUD* with Micronet's *Shades*. This is the first impartial comparison I have seen, and it made many telling observations about both products. However, since it was written from the point of view of a novice, there are a number of important differences which the author was not in a position to note concerning aspects of play at higher levels.

The top level in *MUD*, wizard (or witch), offers much more power than the equivalent in *Shades*, most notably in the ability to snoop on other players, ie, see what they're doing without them knowing. There are other wizard commands available, too, which have no equivalent in *Shades*. *MUD* wizards are much better able to exercise control over play than their *Shades* counterparts.

This brings me to my second point, game management. MUAs allow free interaction between many people; disputes can and do arise. *MUD* has comprehensive logging facilities which enable speedy investigation of players' moans about each other's behaviour. In addition, our substantial experience in managing Essex University *MUD* means we've seen most of the problems before, and know how to deal with them. *Shades* is improving, but still has some way to go.

Richard Bartle
MUSE Ltd
London

SLOG IT OUT

Sir, I have been an avid reader of your excellent magazine for many years. It has been informative and helpful to me as both an Electron user and as a programmer.

Last Christmas, I was given a Slogger ROM Box Plus. I can now use ROM cartridges (ie, *View* at the moment), a printer (borrowed from a friend) and up to four ROMs plus two ROM adapters. I am particularly interested in buying 'compatible' ROMs. There is currently no list available which tells the Elk owner whether a ROM uses mode 7 or if it will work with the Elk. Many of the ROMs for the BBC are expensive, and marketed at millionaires only! Such a list would avoid buying expensive ROMs and which would gather dust because the supplier won't exchange them if they aren't compatible. I noticed you produced a list for the B+ shortly after it was launched. Carry on the good work and more Elk programs please!

Gerard Millar
Wirral

GREEK LETTERS

Sir, I have been trying without success to get a program which will allow me to produce user-defined characters (Greek letters) for use in *View*. I have a BBC B computer with *View* 2.2 and an Amstrad DMP2000 printer which as far as I know is completely Epson compatible. In the Epson LX80 booklet is a program which should allow me to do what I want, but although I have 'translated' it from Amstrad Basic to BBC Basic, I have so far been completely unsuccessful in getting it to print any Greek characters. This may be of interest to other BBC/*View*/Epson users.

A I Tiffin
Reading

Here is a BBC Basic version of the program fro the Epson LX80 manual:

```
10 VDU 2
20 VDU 1,27,1,ASC
"x",1,0
30 VDU 1,27,1,ASC
":",1,0,1,0,1,0
40 VDU 1,27,1,ASC
"%",1,1,1,0
50 VDU 3
60 READ A$
70 IF A$ = "XX" T
HEN END
80 VDU 2
90 VDU 1,27,1,ASC
"&",1,0,1,ASC A$,1,A
SC A$,1,128
100 FOR K% = 1 TO
11
110 READ F% : VDU
1,F%
120 NEXT K%
130 VDU 1,27,1,ASC
"%",1,0,1,0
140 PRINT A$; " be
comes ";
150 VDU 1,27,1,ASC
"%";1,1,1,0
160 PRINT A$
170 VDU 3
180 GOTO 60
190 :
200 DATA "α",8,20,
34,0,34,20,8,20,34,0
,0
210 DATA "β",2,4,8
,20,34,80,130,20,104
,0,0
220 DATA "γ",32,2,
20,1,8,1,20,2,32,0,0
230 DATA "μ",1,62,
0,2,0,2,0,60,2,0,0
240 DATA "λ",2,0,6
8,40,16,8,4,0,2,0,0
250 DATA "Σ",130,6
8,170,16,130,0,130,0
,130,0,0
260 DATA "XX"
```

REPTON REPLICATION

Sir, I am writing to you concerning *Repton 3*, as I'm sure I'm not the only one who has finished the 24 screens!

I have just finished designing another 24 screens, much harder than the originals. They also include some new features, which make the game much more difficult to complete.

I was wondering if any of your readers had done the same and if they would like to swap them? My screens were designed on my Acorn Electron, I'm not sure if they would work on a BBC micro. If anyone does want to swap would they please send their screens to me on a C15 tape, I will be only to pleased to return my screens. Before I finish I would like to know if it is possible to include more Electron reviews in your magazine, as there is a lot of Elk users out here who read *Acorn User*.

Steve Gainham
Staffs

Steve Gainham's address is 41 Somerville Road, Alrewas, Nr Burton-on-Trent, Staffs.

Although Superior are planning to release their own new screens for Repton 3, this seems like a good idea.

WRITING ON ROMS

Sir, I would be very glad if you could give some information on the serial ROM system attached to the much undervalued and under-used BBC B speech processor. I have recently fitted this system, and would like to programme some serial EPROMs for use with the ROM cartridge socket.

Can you tell me if such devices are still available, and if so, who makes or sells them? I know that Acorn was intending to produce ROM firmware and more speech 'PHROMs' in this format, and so I wrote to them with a request for information. Amazingly enough, the Andy Smith who replied to me claimed to know nothing about the serial ROM system or why it was dropped by his company, and he actually suggested I continue my enquiries with my 'local dealer'! Can you believe that? So much for Acorn's 'help'. It is worth pursuing this subject a little, I think, since the ROM cartridge system would be quite useful if one could only obtain suitable EPROM chips, I'd be most grateful for any information you or any readers can supply.

R D Wright
Surrey

The serial ROMs were intended to be plugged into the hole on the left of the keyboard on BBC model B micros. But neither Acorn nor anyone else has made use of the facility.

If you want to use cartridges with your micro, perhaps a system like the Viglen or Case Electronics systems would fit he bill. These allow normal sideways ROMs to be plugged into a special socket at the left of the keyboard.

HINTS & TIPS

Martin Phillips discusses screen dumps, multiple monitors and a range of hints for programs and printers.

PART-SCREEN SCREEN DUMPS

Following on from last month's Hints & Tips article on screen dumps, listing 1 on the yellow pages shows a screen dump that will dump just part of a screen. This is an extension of listing 4 presented in May's Hints & Tips. The dump requires four numbers to be stored in memory before it will work. These are the screen co-ordinates of the bottom left and the top right-hand corners of the screen area to be printed. They are stored in memory locations &80 to &87 in the following way:

```
!&80=xmin : !&82=ymin
!&84=xmax : !&86=ymax
```

The ! indirection operator is normally used to store a four-byte number, storing the lowest byte first. Storing the hexadecimal number &12345678 using the ! operator by entering:

```
!&80=&12345678
```

would put

&78 in location &80
&56 in location &81
&34 in location &82
&12 in location &83

The screen co-ordinates are each given as a two-byte number. Putting the next screen co-ordinate into a memory location two bytes further on overwrites two zeros, which are not required. This is a much neater way than having to split up each co-ordinate into the low-byte number and the high-byte number:

```
?&80=xmin MOD 256
?&81=xmin DIV 256
```

The changes that have been made to the assembler listing given last month are first to use the lower X and Y co-ordinates instead of assuming the dump starts at 0,0. This is done at start for the X co-ordinate, and at 'newline' for the Y co-ordinate.

The number of graphics characters sent to the printer on each line also has to be changed. This is sent to the printer each time a new line is started, and forms part of the 27,42,n1,n2 printer command in label 'newline' where n1 and n2 form a two-byte number giving the number of bytes of graphics information to be sent. See Hints & Tips September 1986 for a fuller description. The number of dots to be sent will be the height of the required screen dump divided by two. (The dump prints sideways.) Finally, there is a test to stop the dump. It needs to compare the right-hand X co-ordinate stored at location &84 and &85. This is done at the label 'checkend'.

Listing 1 draws a set of random triangles in black on a white background. Then a red rectangle is drawn, and the area inside the rectangle is dumped to a printer. The rectangle is only drawn for the purpose of the demonstration and serves no useful part in the program. The size of the dumped area can be changed to suit a particular application. It should be noted that as in the X direction the screen dump scans across 16 pixels, a few dots might appear outside the rectangle. These will always appear at the bottom of the printout. The listing can be saved as an assembler listing by running the program and then typing:

```
*SAVE PDUMP 900 +F0
```

Then to use the dump, enter the two sets of co-ordinates as described above, load the dump into memory and call it up using:

```
CALL &900
```

As an alternative to loading the dump at the start it can be loaded and run from disc by using:

```
*LOAD PDUMP
```

Do note there are no checks in the assembler listing to ensure that the co-ordinates given are sensible. Therefore, if such a routine is included in a program, then you should ensure that each co-ordinate is in the range of the screen graphics area and that maximum points are greater than minimum points.

A useful adaptation of this listing could be made to dump a graphics window. It is possible to retrieve the co-ordinates of the graphics window and then use these. Listing 2 on the yellow pages gives an example of how to find them. It could be simplified if the assumption is made that the VDU varibles are stored at locations &300 onwards, which they are on all current BBCs. However *FX174 will tell us where the variables are stored. Listing 2 also has a simple routine to identify the graphics modes from the non-graphics modes.

£5 INFILLING SHAPES

Here is a small program which will be very useful to anyone who likes drawing pictures or shapes in their programs. It was sent in by Nathan King, aged 14.

His program (listing 3 on the yellow pages) draws and fills in a yellow triangle. The figure could be changed to any shape, but occasionally you may have to use it more than once in an irregular shape. To start filling, call up PROCfill. The first two numbers are where the program starts filling from, but the second must have 10 added to it to ensure that the starting point is inside the shape. The third number is the highest point in the shape to be filled. The fourth number is the colour. When the colour currently filling hits a white line, it moves up four points and fills in the opposite direction. This continues until the value of 'hi' is reached. Mode 2 has been used here because of the range of colours available but the program can easily be converted in a different mode. Then the value of 'step' would need changing too.

Mode 0 . . . step=2
Mode 1 or 4 . . . step=4
Mode 2 or 5 . . . step=8

£5 COPAL 1000 PRINTER

Colin Attenborough has a Copal 1000 printer. He likes the font that is obtained by combining double-width and condensed type, but the printer can't retain the double-width mode for more than one line. This is a nuisance when using *Wordwise*, so he has written a program to remind the printer of the double-width and condensed codes every time it receives a carriage return code (listing 4 on the yellow pages). It follows that the file must start with a carriage return, so that the printer is told of the desired mode before the first line of text. The code generated is stored at &900. Once the program has run the code can be saved under the filename 'CODE' by typing:

```
*SAVE CODE 900 +50
```

To use the code, generate the *Wordwise* file on a disc containing the code, return to the menu, type *CODE and then print the *Wordwise* file. Return to the menu, press Break to restore the vectors modified by the code, and continue as normal. The assembler program may be discarded when the operation of the code has been fully checked.

Contrary to Tom Weber's letter in December, the Copal 1000 can do italics, according to Colin. Turn them on with VDU 1,27,1,&73 and turn them off with VDU 1,27,1,&74. In *Wordwise*, use the embedded commands OC27,&73 and OC27,&74

£5

CALCULATED GOTOS

Although generally frowned upon, calculated GOTOs and GOSUBs can be useful in a program. The main problem with these is that if the program is renumbered, the computer is unable to renumber these correctly. Mr L Phillips from Surinam suggests that they are put on a separate line, outside the PROC, not in the normal flow of the program, a line 'nn GOTO target', where 'target' is the base line number of an expression such as RESTORE (2000 + X). Then after renumbering this gives a quick reference for editing.

£5

TEAR-BAR FOR THE EPSON LX80

As a radio amateur, Bob Panting from Reading finds it more advantageous to use paper rolls on his Epson LX80 when operating in RTTY mode. However, the LX80 has no tear-bar so he constructed a simple device for the purpose from an old hacksaw blade and a small piece of aluminium (see figure 1).

The simplest way to shorten the blade is to put it in a vice and break it off to length. To cut out the clips, use a 1.5mm drill at points X on the diagram – then cut round using a fretsaw or a jeweller's saw.

After cutting out, the clips should be formed by using another piece of aluminium as a spacer and bending the clips as shown. These want to be a tight fit on the LX80 head access flap. Glue the blade on with Araldite and give the whole thing a coat of paint.

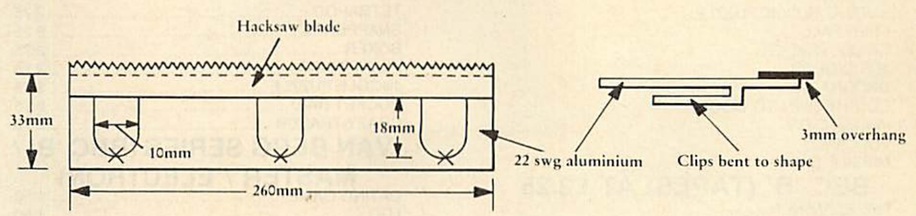


Figure 1. Avoid rip-offs with this DIY tear-bar for the LX80

£5

TRUE OR FALSE

After a request for 'elegant' uses of 'TRUE' and 'FALSE' in November 1986 Hints & Tips, Derek Middleton from Nairobi has sent in a short routine (listing 5). His procedure is called whenever a yes or no response is required. It will accept only 'Y', 'y', 'N' or 'n' as valid inputs, and will return 'yes=TRUE' or 'no=FALSE'.

```
   10 REM Hints & Tips L
isting 5
   20 PROCask("Do you un
derstand")
   30 IF yes THEN PRINT
"Good"
   40 PROCask("Shall we
do it again?")
   50 IF no THEN END ELS
E RUN
   60 :
   70 DEF PROCask(A$)
   80 LOCAL A%
   90 PRINT'A$;" (Y/N) "
;
  100 REPEAT
  110 A%=(GET AND &DF)
  120 yes=(A%=89)
  130 no=(A%=78)
  140 UNTIL yes OR no
  150 ENDPROC
```

Listing 5. Neat use of TRUE and FALSE

£10

SPOOL TIP

Jim Sharp from Featherstone has sent in a super tip that certainly earns him £10. It is a tip that I feel sure I should have known about, but it is one that I have never thought of before. Did you know that when a SPOOL file is opened, *all* the bytes that are sent to the VDU drivers are also sent out to the SPOOL file. This means that any graphics display which can be treated using 'legal' programming techniques can be saved to disc using far less disc space than would otherwise be the case. A useful point is that it is also possible to change mode using VDU22,7 (care!) and to change the screen colours. This is normally not possible when saving each byte to disc. As an example try listing 6, below.

A file called LINES can be made when listing 6 is run, and when the command:

*EXEC LINES

is typed in, the screen display produced by running the last program will be replayed to the screen. Line 80 is needed to close the file before the Basic prompt '>' is printed, or this too will be sent to the file. This simple method works for most of the VDU commands including MOVE, DRAW, COLOUR, GCOL, screen windows and so on.

There are several advantages to this kind of technique:

- Used instead of a procedure to produce a screen image, valuable program space will be saved.
- Unless the display is particularly complex, there will be a reduction of disc space needed to save the screen in comparison to using the relevant *SAVE command.
- Machine code programmers can use this method to compile a list of the raw VDU codes to be sent to oswrch. All the necessary padding zeros and so on are present. The computer will do all the work!
- As in the example in listing 6, a series of repeatable random screens can be produced this way.

```
   10 REM Hints & Tips L
isting 6
   20 *SPOOL LINES
   30 MODE 0
   40 VDU 19,0,4,0,0,0
   50 FOR L%=1 TO 100
   60 DRAW RND(1300),RND
(1100)
   70 NEXT L%
   80 *SPOOL
```

Listing 6. SPOOLing graphics to disc

RUNNING THREE MONITORS FROM ONE MICRO

If the BBC micro is being used for demonstration work it is often useful to be able to connect more than one monitor to the computer. A useful combination is one 14-inch monitor for the speaker's use and one or two 20-inch monitors for the audience. The BBC micro will drive all three at once, with only a little blurring of the screen. To achieve this you will need a passive splitter box as shown in figure 2. It is constructed from a plastic box with a lid. Three six-pin DIN sockets are fitted in the lid. The three sockets are wired together, and the free six-pin plug with half a metre of wire is wired to these sockets.

The connections are easy: simply wire pin 1 to pin 1, pin 2 to pin 2 and so on. There is no need to wire the central pin, pin 6. The pin numbers are usually printed on the solder side of the plugs and sockets, so little should go wrong.

To complete the system, two of the one-metre leads supplied with the monitors are needed, together with two leads, each five metres long, which have to be made up. One of these leads can be fitted with two six-pin plugs, and the other with a six-pin plug at one end and a six-pin free socket at the other. This gives a flexible system to allow plenty of scope for positioning the monitors.

The four-core cable is the problem. Much of the four-core cable that is readily available has a very fine wire gauge, and soon breaks internally in use. Try to obtain cable with each core at least 7/.02. Screened cable is not necessary but does help to give the cable strength. The lengths of the leads are critical: the total lead length should be no longer than 12 metres. A lead any longer than this starts to degrade the signal to a noticeable extent. Such an RGB splitter has no ill effects to the computer.

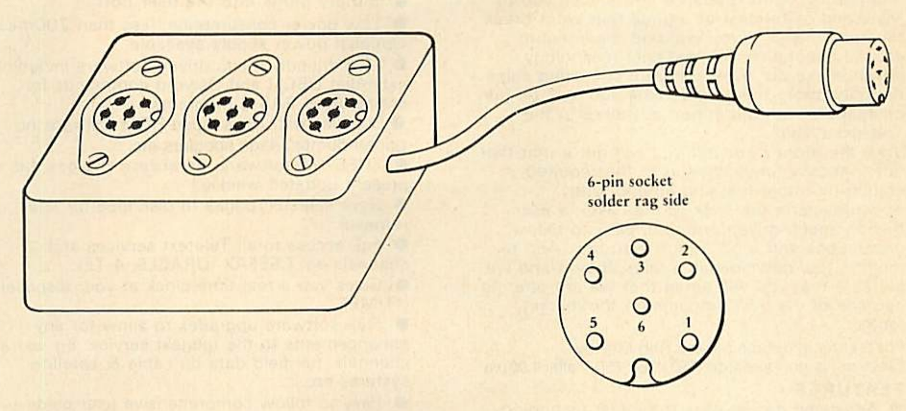


Figure 2. One into three will go – a passive splitter box

LINE COUNTS IN VIEW

The letter from Maurice Gordon-Edgeley in April's *Acorn User* has provoked a lot of interest in line-counters for *View*. His problem was to discover whether a piece of text was too long to fit on a particular page. He found he had to constantly adjust the document to arrive at a satisfactory presentation on the page. Several readers have related similar experiences, and have submitted a few tips they have found useful. Two of the simplest ideas have come from readers K V Meader of London and J Furse of West Sussex.

J Furse writes, 'Having suffered from the same problem as your correspondent – not knowing the finished length of a document before printing – I am happy to pass on the solution I have found. By inserting an LJ (left justify) edit command, followed by |L (which must be in upper case) at the required points, on screening the text, the number of lines can be read from the screen. Remember to delete the line containing the LJ command before printing, otherwise the line count will appear on the final printed version.'

Though this method is good for letters, for example, in fact it only works for text of one page or less. This is because *View* keeps the current line number in its L register (that is what | L means). When it moves on to another page, L is reset to zero. If you insert PL 255 at the top of the text, then up to 255 lines can be counted in this manner. It should be noted that | L gives the number of the current text line, not the number of the line on the paper, so the first line of text on a page is always 1, no matter how large the margin at the top of the page is.

In a similar way, | P is often used to give the current page number, and this is the basis of the next suggestion. The suggestion from K V Meader allows any length of document to be counted. He writes, 'Screening is usually an adequate method of checking whether material will fit in a particular space. But if your correspondent really needs a line counter, all he has to do is use edit commands to reduce the page length so that 10 lines of text appear on each page.

'Try LP 28 first, as this allows for the default margins. Then define a footer with DF //| P200//. By screening adjust the PL number if necessary. Then screen the whole text, and the number of lines will be shown after every 10. When the required document length has been achieved, your correspondent can then delete the two edit command lines.'

Graham Bell

£5

INTERSHEET TIP

R W Hemsley from Hastings thinks that the following may be of some interest to other *InterSheet* users.

If there is need to use more than one page, then the following short listing will save time loading each one in.

Name the program 'KEY' and each time these files are required then simply CH."KEY" and press f0 to auto load *InterSheet* and all of the files listed in the program above.

```
   10 *KEY0 *IS.|M  2|
FILE0|M  *IS.1|M  2| FIL
E1|M *IS.2|M 2| FILE2|M
*IS.3|M 2| FILE3|M *IS.4
|M 2| FILE4|M
   20 END
```

To load several *InterSheet* pages

In the above program filenames FILE1, FILE2 and so on have been used; these will of course have to be changed to suit the existing page titles.

FIRST BYTE

ASSEMBLING BASIC

It's not difficult to convert Basic statements into machine code

Tessie Revivis

Producing graphics from machine code is not particularly hard, as we saw last month. What follows is a simple guide to simulating a variety of Basic commands in assembler. The list will be concluded in next month's issue.

ASC

The ASC command is used to obtain the ASCII code of a character. The letter A has an ASCII code of 65 decimal and this could be found and printed with a line of Basic:

```
PRINT ASC("A")
```

The microprocessor in fact always deals with ASCII codes when manipulating characters. For example to get the ASCII code of the letter A into the accumulator we just use the ASC command within the assembler with immediate addressing thus:

```
LDA #ASC ("A")
```

CHR$

This Basic command prints the number following it as an ASCII character:

```
PRINT CHR$ (65)
```

would display the letter A on the screen. In assembler all we need to do is to load the number into the accumulator and then output it through OSWRCH as listing 1 demonstrates.

```
 10 REM PRINT CHR$ 65
 20 DIM code% 50
 30 P% = code%
 40 [
 50 .dochr
 60 LDA #65
 70 JSR &FFEE
 80 RTS
 90 ]
100 CALL dochr
```

Listing 1. Using OSWRCH

CLS

This is one of the easiest to perform, CLS simply means clears the screen and all you need to do this from assembler is to send 12 to OSWRCH:

```
.docls
LDA #12
JSR &FFEE
```

CLG

This Basic command clears the graphics area of the screen to the current graphics background colour as set with the GCOL command. It is done in assembler by loading 16 into the accumulator and sending this to OSWRCH. In Basic we could obtain a red mode 2 graphics screen like this:

```
10 MODE 2
20 GCOL 0,129
30 CLG
```

Line 30 could be replaced with machine code that performs the following:

```
LDA #16
JSR &FFEE
```

MODE can be performed in assembler and so can GCOL so we'll produce a machine code program to do the above three lines of Basic in the description of GCOL on page 51.

DATA and READ

The DATA statement is used to store items of information, be they numeric or ASCII strings. DATA is used to store information used by the program – the following Basic program will read five ASCII code numbers stored as DATA and print the character they represent:

```
10 FOR loop=1 TO 5
20 READ A%
30 PRINT CHR$(A%)
40 NEXT
50 DATA 65,66,67,68,69
```

The READ command is performed by the instruction LDA, thus the Basic command:

```
READ A%
```

can be directly replaced with:

```
LDA A%
```

where A% is the address of the data. If there are several items of data to be read then a loop using indexed addressing needs to be put together. Before the data can be read it must be stored in the program and this can be done in one of two ways. On all except early BBC model As and Bs there is a ready-made instruction in the assembler for assembling a single byte of data – the instruction is EQUB. To store 65 in the program at a particular point use:

```
EQUB 65
```

Basic is friendly in that it will keep track of the data to be read. Machine code is another matter and the machine code program must itself keep track of where the data starts and where the current data item is. This is best done by marking the start of the data with a label as the following segment shows:

```
100 .data
110 EQUB 65
120 EQUB 66
130 EQUB 67
140 EQUB 68
150 EQUB 69
```

The EQUB instruction is not installed on early BBC micros fitted with Basic I. If you have Basic I then leave the assembler, having marked the data label, and poke the data into memory using the ? operator:

```
150 .data
160 ]
170 ?P%=65
180 P%?1=66
190 P%?2=67
200 P%?3=68
210 P%?4=69
220 P%=P%+5
230 [
```

We simply add one, two, three and four to P% to assemble the bytes consecutively. An instruction such as P%?3=68 is an easier way of writing ?(P%+3)=68 in BBC Basic – the result is the same. The instruction in line 220 increments P% past the data before the assembler is re-entered in line 230.

The listing overleaf is the final READ and DATA program, being the direct equivalent of the Basic version given earlier.

Basic I users can replace lines 160

onwards with those using the P% in the previous listing except that lines 230 and 240 should read:

230 NEXT pass
240 CALL code%

FOR . . . NEXT

The Basic FOR. . . NEXT loop is a useful structure which at first sight seems difficult to convert into assembler. This is simply not the case, in fact we did it in the READ. . . DATA program above to read five bytes of information. However, there are several types of FOR. . . NEXT loop so let's take each one in turn.

The simplest loop is one that counts from one number to another in single increments as follows:

FOR loop=first TO second

In this type of loop we are interested in the values held in the constants 'first' and 'second'. All we need to do is to load 'first' into our indexing register, X, and then increment this each time through the loop comparing it with 'second'. When 'first=second' the loop is complete and can finish. The assembler uses FOR. . . NEXT to print 10 asterisks in listing 3.

Basic finishes the loops when 'loop' exceeds 'second'. The machine code version finishes when 'X' equals 'second': to account for the difference we use 'first−1' when initialising the X register, so that the machine code loop is executed the same number of times as the Basic version.

```
   10 REM read 5 bytes o
f DATA
   20 DIM code% 50
   30 FOR pass = 0 TO 3
STEP 3
   40 P% = code%
   50 [OPT pass
   60 LDX #0
   70 .loop
   80 LDA data,X
   90 JSR &FFEE
  100 INX
  110 CPX #5
  120 BNE loop
  130 RTS
  140 :
  150 .data
  160 EQUB 65
  170 EQUB 66
  180 EQUB 67
  190 EQUB 68
  200 EQUB 69
  210 ]
  220 NEXT pass
  230 CALL code%
```

Listing 2. The final program

Listing 3 illustrates this simple technique. The direct equivalent in Basic would be:

FOR loop=first TO second:PRINT "*";:NEXT loop

The next type of FOR . . . NEXT loop is one that uses the Basic STEP command to generate an increment other than the default value of one, for example:

FOR loop=first TO second STEP number

In this case the loop goes from 'first' to 'second' but loop is incremented by the value of 'number'. So if 'first' was one, 'second' was 10 and 'number' was two the loop would execute five times. Again this is quite easy to do: simply increment the loop counter by whatever value 'number' is. Using the above values the assembler would be as follows:

```
LDX #0
. loop
LDA #ASC"*"
JSR &FFEE
INX
INX
CPX #10
BNE loop
RTS
```

An extra INX instruction has been added to perform the STEP 2 operation. Of course we can step any size we wish simply by inserting INX required number of times. However for increments of five and greater it is better to move the loop counter into the accumulator and add the required step count to it before moving it back into the count register.

```
   10 REM print 10 stars
   20 DIM code% 50
   30 first = 1
   40 second = 10
   50 FOR pass = 0 TO 3
STEP 3
   60 P% = code%
   70 [OPT pass
   80 LDX #first - 1
   90 LDA #ASC"*"
  100 .loop
  110 JSR &FFEE
  120 INX
  130 CPX #second
  140 BNE loop
  150 RTS
  160 ]
  170 NEXT pass
  180 CALL code%
```

Listing 3. Using FOR. . . NEXT

The loops so far have been positive, but FOR. . . NEXT loops may also work in reverse by employing a negative STEP value as shown here:

FOR loop=first TO second STEP −1:PRINT "*":NEXT loop

This is even easier to perform, as we simply load 'second' into the count register first and decrement it each time through the loop until it hits zero:

```
LDX #second
. loop
LDA #ASC"*"
JSR &FFEE
DEX
CPX #first
BNE loop
RTS
```

GCOL

The final command this month is GCOL. In Basic the command takes two parameters – the first specifies the action and the second the actual colour. As we saw above in the description of CLG the command GCOL 0,129 will plot a red background. GCOL is a graphics-orientated command so it uses the VDU driver at OSWRCH. To use it code 18 must be sent followed by the option and then the colour. Thus GCOL 0,129 in assembler would be:

```
LDA #18
JSR &FFEE
LDA #10
JSR &FFEE
LDA #129
JSR #FFEE
```

The program example given earlier for CLG could be performed in machine code by running listing 4.

```
   10 REM do GCOL 0,129
   20 DIM code% 50
   30 P% = code%
   40 [
   50 .mode2
   60 LDA #22
   70 JSR &FFEE
   80 LDA #2
   90 JSR &FFEE
  100 :
  110 .dogcol
  120 LDA #18
  130 JSR &FFEE
  140 LDA #0
  150 JSR &FFEE
  160 LDA #129
  170 JSR &FFEE
  180 :
  190 .doclg
  200 LDA #16
  210 JSR &FFEE
  220 RTS
  230 ]
  240 CALL code%
```

Listing 4. Using the GCOL command

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ACORN FORUM

David Atherton takes a tour round readers' ideas and programs

This is the first edition of Acorn Forum compiled by David Atherton of BBC and Abuser's Diary fame. Our thanks to Mike Barwise for sterling service over the last two years. Mike – the last bastion of Atom-dom – is working on the Inmos Transputer now!

£5

LOCAL AND GLOBAL VARIABLES

Forum opens this month with an interesting quirk in Basic concerning local variables from Dave Instone of Hayling Island. Dave has found that if one procedure calls another procedure, and the first procedure has a local variable, any reference to that variable in the second procedure will produce the local value from the first procedure, not the global one. Dave has sent listing 1 (on the yellow pages) which prints out the value of Z, and demonstrates the effect. As he points out, this effect is in line with other structured languages like Pascal, but it could cause problems if you have a library of commonly used procedures which use the same variable names. Dave earns a fiver for his tip.

£10

LETTER FROM RUSSIA

Here at *AU*, we get letters from all over the world but Dr Sergei Krasnoshchiokov is, we think, our first correspondent from the USSR. Sergei, who hails from the Department of Chemistry, Moscow State University, offers us an interesting procedure to draw large characters in mode 7 by plotting the character onto the mode 7 'pixel map' (80 × 75 resolution) from the standard character matrices.

The procedure works by calling OSWORD &0A, which reads the definitions for a character into a memory block. This is then used to fill a two-dimensional array (8 × 9) with the pattern for the character. Each array element is set to one if there is a pixel in that part of the matrix, otherwise it is set to zero.

The final loop in the procedure works out and prints the appropriate teletext graphic character for each 2 × 3 part of the



Dr Kranoshchiokov's large characters

8 × 8 matrix. An 8 × 9 array is used, just to make Basic happy. The elements (1,9) to (8,9) are never set to anything other than 0.

Sergei has allowed you to select teletext colour and line (Y-axis) positioning in the procedure. The X-axis positioning is fixed, but may be altered by changing the value '2' in the line:

PRINT TAB(2,line%);

Do not choose any value less than two, or the graphics will not reproduce correctly. To get continuous graphics instead of the separated type, substitute a CHR$(32) for the CHR$(154) in the second line of the procedure. See listing 2 on the yellow pages for details.

Note that because this procedure uses OSWRD &0A to call character patterns, it will correctly display any user-defined characters as well. *Spasibo, Sergei!*

£5

MASTER MEMORY CONTROL

Mr M C Parson of Ryde, Isle of Wight, has found a very small bug in the Master 128 machine operating system (MOS), concerning FX107 which is supposed to select either the internal or external (cartridge) 1MHz bus. This is done by setting and resetting bit five of ACCCON (&FE34). The relevant code in the Master MOS is at &EE9E to &EEB0, but this routine is used for both FX107and FX108. The routine finishes with:

LDA #&04
TSB &FE34

which always sets bit two of ACCCON. In short FX107,0 works correctly, but FX107,1 is effectively translated into FX108,1. This would only be a problem for people developing cartridge-based hardware. I understand that this will in fact be fixed in the next release of the Master Megabit ROM.

The new Megabit ROM is currently undergoing field trials. As soon as I have a definitive version, I'll let you all know about it. It contains such goodies as ADFS Format and Verify, *CONFIGUREable *View* Setup, and an improved DFS, with much faster OSGBPB operation, and things like the *CLOSE bug cured. I understand that Acorn is going to release this as a separate product so that existing Master 128 owners can upgrade.

In the meantime, I am very interested to hear of unusual and interesting points about the Master 128 and Compact. These machines have not yet been 'hacked' as thoroughly as the BBC B micro, and there are many undiscovered hints and tips.

£10

AMX FONT TRANSFER

AU graphics specialist Phil Wilkes uses AMX *Super Art* and *Pagemaker* and found that although the fonts used by both packages are designed on a 16 × 16 grid, they are stored in different ways, so they cannot be used directly by the other programs. Phil's routine allows *Pagemaker* fonts to be automatically converted to the *Super Art* font format, and thus usable in the latter package (listing 3, yellow pages).

The routine is fairly short and prompts the user throughout on changing discs and displaying the available font files. Phil recommends that a separate '*Super Art* Font' disc is created by saving the routine to a blank formatted disc and first copying the standard *Super Art* fonts onto it. The *Pagemaker* fonts can then be copied using the routine. Note that at least the F.GOUDA font needs to be present, as this is used as a template.

Using the fonts from *Super Art* is then just a matter of using the 'Fonts' option from the 'Goodies' menu, swapping the program disc for the font disc when entering the font name and swapping back once the font is loaded.

Vine Micros

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£ 9.99	25 disks
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ACORN FORUM

£15 GREEK REVISION

Following the article by Albert Koelmans, 'It's all Greek', in the February issue of *Acorn User*, I received a very interesting program from Patrick McTiernan, who explained the following. . .

I have been fascinated by the simplicity of programming that can draw amazingly complex patterns, such as the *Tree of Pythagoras* published in February.

I rewrote the Pythagoras program as a recursive procedure. Listing 4 produces the effects of the original article's listing 1 and 2 successively.

As a recursive routine, it was about 194 per cent faster than the original listing, despite requiring less memory. Because of this, it could be altered to run in mode 1 or mode 2 and various colours could be introduced to the program.

The fact that the program runs with half the number of program lines illustrates some important programming principles. First, avoid unnecessary duplication of code. Take statements outside loops whenever possible. Second, trigonomic functions and squaring are slow, so don't use them unnecessarily.

Third, it's quite important to pick the place where recursion takes place. For example, the original program plotted a square and a triangle at each level, whereas the improved version plots only a square, because the triangle appears when the next square is drawn. This fact accounts for much of the speed increase.

A very nice hint and useful too. Patrick earns £15 for that submission.

MASTER SIDEWAYS SCREENS

Keen students of the new VDU 23 commands on the Master series may have come across one particular favourite of mine, the VDU 23,16 command which controls cursor movement. Following this with a 10, and the required number of zeros (or a double bar):

VDU 23,16,10¦

will cause the entire VDU text output part of the operating system to move through 90 degrees – what was the top-right now becomes top-left. What was bottom-right becomes top-right and so on. Try typing it to see what I mean.

```
   10 REM Sideways VDU
   20 REM by D Atherton
 and D Spencer
   30 REM for M/C only
   40 REM (c) Acorn User
 June 87
   50 :
   60 osword=&FFF1
   70 oswrch=&FFEE
   80 osbyte=&FFF4
   90 zp=&80
  100 FOR pass=0 TO 3 ST
EP 3
  110 P%=&900
  120 [OPT pass
  130 LDA #20
  140 JSR osbyte
  150 LDA #33
  160 STA pblk
  170 .loop2
  180 LDA #10
  190 LDX #pblk MOD 256
  200 LDY #pblk DIV 256
  210 JSR osword
  220 LDA #23
  230 JSR oswrch
  240 LDA pblk
  250 JSR oswrch
  260 LDY #7
  270 .loop
  280 LDX #0
  290 .loop1
  300 ASL pblk+1,X
  310 ROR A
  320 INX
  330 CPX #8
  340 BNE loop1
  350 JSR oswrch
  360 DEY
  370 BPL loop
  380 INC pblk
  390 BNE loop2
  400 LDX #0
  410 .loop3
  420 LDA side,X
  430 BMI out
  440 JSR oswrch
  450 INX
  460 BNE loop3
  470 .out
  480 RTS
  490 .side
  500 EQUB 23
  510 EQUB 16
  520 EQUB 10
  530 EQUD 0
  540 EQUD 0
  550 EQUW 23
  560 EQUW 10
  570 EQUD 0
  580 EQUD 0
  590 EQUB 12
  600 EQUB 255
  610 .pblk
  620 ] NEXT
  630 CALL &900
```

Listing 5. Turns text on its side

Before you can actually pick up your monitor and turn it by 90 degrees, you'll have to alter the orientation of the characters. That's quite easy – they can all be redefined using a neat little rotation algorithm that's usually found on dot-matrix screens dumps. Listing 5 redefines all the characters from 33 to 255, and then outputs a stream of control codes from a table, performing a VDU 23,16,10¦ followed by a command to redefine the cursor as a block, and finally a CLS. The cursor is defined as a block because it cannot be persuaded to 'turn sideways'.

Run the software, then press Return a few times, or perhaps *HELP. If possible, pick your monitor up with the screen facing you, turn it anti-clockwise by 90 degrees. Turn the power off while you do this. You'll find that you now have screen modes with 25 or 32 columns, but up to 80 lines. This can be very useful with long assembler listings for example. Note that most software won't know about the new screen format, but some packages, for example BBC Soft's *Ultracalc*, surprisingly do recognise it. I'd be most interested to hear of any others.

Neither I, nor *Acorn User*, can be held responsible for anyone breaking their monitors by turning them on their side. If your monitor looks as though it won't stand being turned, turn your head instead! Turning monitors sideways should in all cases be done as a temporary action to test this program, not as a permanent installation. Don't do this with TV sets!

RICH AND FAMOUS

Have you got a bright idea? If so, get it down on paper. It could make you slightly rich and quite famous. I'm particularly keen on Master 128/Compact material, and filing system and sideways RAM-related stuff. Write to David Atherton, Acorn Forum, *Acorn User*, 141-143 Drury lane, London WC2B 5TF.

We award up to £20 for the very best and most original submissions, and of course, your tip is printed in over 55,000 copies of *Acorn User*.

Turn to the yellow pages index on page 113 for details of the Acorn Forum listings.

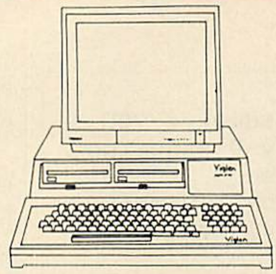
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Viglen

SYSTEMS



COMPLETE SYSTEMS FROM VIGLEN

The following systems come complete with the BBC Master and drives fitted in the Viglen Master Console unit.

Stock Code	Description	Price inc. VAT
V250	Viglen Master System 1 This system includes: BBC Master128K in Console unit Single 400K (760K double density) 40/80 disc drive. Philips BM7502 Hi Res Green Screen Monitor	£699.00
V251	Viglen Master System 2 This system includes: BBC Master 128K in Console unit Dual 800K (1520K double density) 40/80 disc drive Microvitec standard Res. colour Monitor.	£949.00

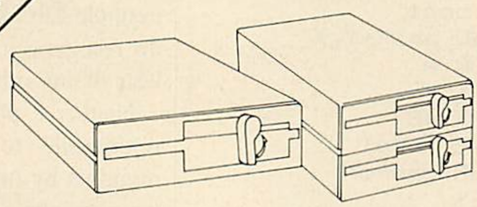
Other systems can be tailor made for your requirements, 3½" drive can be supplied instead of 5¼" at the same price. Please call.
To complete the system you only need to add a printer from any of the range.

Please add £12.00 for insured courier delivery.

DISC DRIVES

FROM **£99** inc. VAT

The finest Japanese disc drives (not Taiwanese immitations) available at the lowest prices.



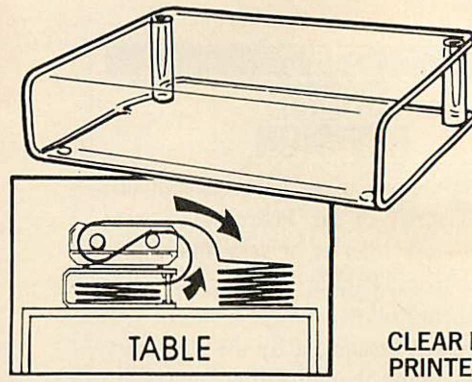
Items marked ☆ are special offer products.

All disc drives are supplied with a manual, packed utilities disc and a full 12 Months warranty (2 Year Warranty available) and are ready to plug in and use on a BBC B (fitted with a DFS) B + or Master micro. 40/80 Track drives have a switch which enables operation in either 40 or 80 track mode.
The capacities quoted are given in single density mode; for double density mode (1770 DFS + ADFS as in the Master) the capacities should be approximately doubled.
An integral power supply is not necessary as the disc drives run from the micro's power source however should you require drives with their own power supply, these are also available.
If your BBC B micro does not have a DFS fitted then you will also require the Acorn dfs kit.

Stock Code	Description	Price inc. VAT
SP014☆	Single 400K Viglen 40/80T Drive	£99.00
SP019☆	Dual 800K Viglen 40/80T Drive	£189.00
V001	Single 100K Viglen 40T Drive	£99.95
V031	Single 100K Viglen 40T Drive + PSU	£119.95
V004	Single 400K Viglen 40/80T Drive	£124.95
V035	Single 400K Viglen 40/80T Drive + PSU	£144.95
V008	Dual 800K Viglen 40/80T Drive	£234.95
V038	Dual 800K Viglen 40/80T Drive + PSU	£279.95
V064	3.5 and 5.25 inch Drives in dual case with Power Supply	£263.95
V062	Single 3.5" 400K Drive + PSU	£129.95
V063	Dual 3.5" 800K Drive + PSU	£229.95
V0254	1770 Kit	£49.95
V0255	Acorn ADFS Rom	£29.95

Please add £8.00 for insured courier delivery.

PRINTER STANDS



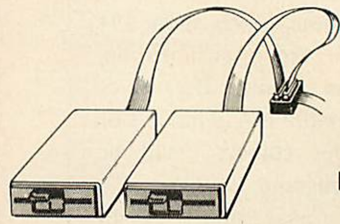
CLEAR PERSPEX PRINTER STAND

The Viglen printer stands are beautifully finished in clear perspex and raise the printer high enough to put continuous stationary underneath.

Stock Code	Description	Price inc. VAT
V490	80 Column Printer Stand (15" × 13" × 3.5")	£19.95
V491	136 Column Printer Stand (23.5" × 13" × 3.5")	£29.95

Please add £3 P & P

DUCKS



DUAL DRIVES FOR LESS THAN £17!

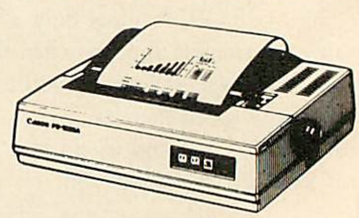
The Viglen Data DUCK (Dualling Up Connector Kit) converts any two single drives to a dual drive instantly. Simply plug the duck into the micro's disc drive socket and plug two single drives (any type and any make) into the duck to obtain a dual drive system accessed as drive 0 (and 2 if double sided) and drive 1 (and 3 if double sided). If neither single drive has its own power supply then you will require a Viglen power DUCK in order to obtain two disc drive power sockets from the micro.

* ★ No soldering simply plugs in.
* ★ No need to take disc drives apart to change links.

Stock Code	Description	Price inc. VAT
V084	Viglen data duck	£16.95
V085	Viglen power duck	£7.95

Please add £2.50 for P & P.

PRINTERS



GREAT VALUE PRINTERS

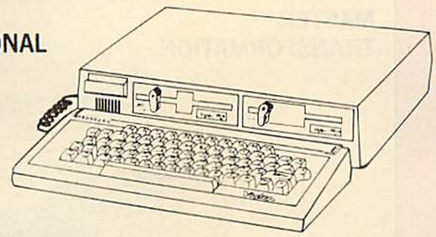
Stock Code	Description	Price inc. VAT
Dot Matrix Printers		
V410	Canon PW1080A/TaxanKP810	£259.00
V420	Epson LX86 with tractor feed	£269.00
V421	Epson FX800	£379.00
V422	Epson LQ800 (200 cps)	£559.00
Daisywheel Letter quality printers		
V400	Juki 6100	£279.00
Ribbons		
V462	Canon PW1080A/Taxan KP810 ribbon	£5.95
V463	Epson MX80/RX80/FX80/FX85 ribbon	£5.95
V464	Centronics GLP ribbon	£3.95
Printer cables		
V495	BBC micro/ Master printer cable	£7.95
V497	Master Compact printer cable	£7.95

Please add £8.00 for insured courier delivery and £1.50 for ribbon.

THE VIGLEN RANGE

BBC CONSOLE UNIT

VIGLEN PROFESSIONAL CONSOLE UNIT



Your BBC micro can be given the professional PC-look by replacing your existing lid with this smartly styled package which can house two disc drives, the *Viglen* Rom cartridge system, most internal boards and can support monitors including 14″ television sets.

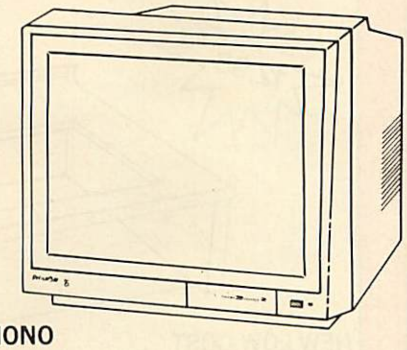
PCU Package includes: Keyboard case, Metal screened main unit, casing including internal fittings, 2 meter coiled cable to connect main unit to keyboard, blanking plates to blank out disc drive apertures, Keyboard label.

Other accessories are also available including units fitted with single or dual drives.

Stock Code	Description	Price inc. VAT
V851	Viglen Professional Console unit for the BBC micro (PCU)	£49.95
Accessories for the Professional Console unit		
V852	2 Meter coil cable on its own	£14.95
V853	Dual drive data cable for console unit	£14.95
V854	Dual drive power cable for console unit	£7.95
V855	Power supply for PCU (capable of running two 1/2 height drives)	£32.95
V856	Fan kit for PCU (only necessary if your BBC normally gets extremely hot)	£34.95
V857	Extension keyboard on its own including coiled cable.	£29.95
V858	Fitting bracket for 3½″ drive	£8.95
	Fitting service available from	£15.00

Please add £6.00 for courier insured delivery.

MONITORS



COLOUR & MONO

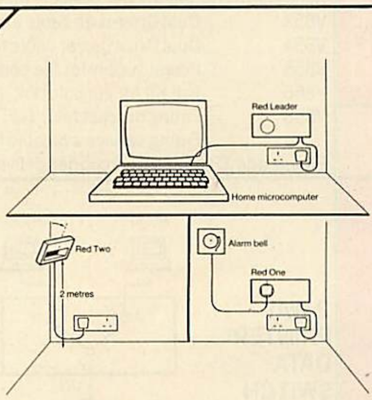
All the following monitors are supplied with a cable to fit the BBC micro/ Master and Compact.

Stock Code	Description	Price inc. VAT
Monochrome Monitors		
V331	Philips BM7502 Hi Res Green	£85.00
V332	Philips BM7522 Hi Res Amber	£95.00
V333	Taxan KX1201 Hi Res Green	£89.00
Colour Monitors		
V300	Microvitec 1431 Std Res Colour Monitor	£229.00
V301	Microvitec 1451 Med Res Colour Monitor	£279.00
V304	Microvitec 1451APL Med Res Colour Monitor with PAL	£299.00
V302	Microvitec 1441 Hi Res Colour Monitor	£449.00
V356	Taxan Super Vision II	£349.00
V357	Taxan Super Vision III	£399.00

Please add £8.00 for insured courier delivery.

RED BOX

AS SEEN ON MICRO LIVE



VIGLEN RED BOXES

The Red Box system offers all home computer/pc owners the opportunity to run their own home control system. The Red Box starter system provides the first step to an almost endless string of possibilities, from time switching to security. Easy add-on options will give you the high-tec home of the future.

All Red Boxes are protected against interference, either malicious or accidental. Each device is assigned a unique, secret code, known only to the owner. All messages between devices are encoded with a secret key, making them even more secure.

All Red Box systems use powerful micro-processors; they are very easy to use and do not require any programming. Your computer controls the system by simple commands given to Red Leader through the keyboard.

The Red Box starter system comprises:

RED LEADER: a powerful micro Processor Controller Red BASIC programme language.

RED ONE: a computer controlled mains socket into which you plug the appliance to be controlled.

RED TWO: an infa-red sensor which automatically reports any movement to Red Leader.

RED BOX: home control at the touch of your micro.

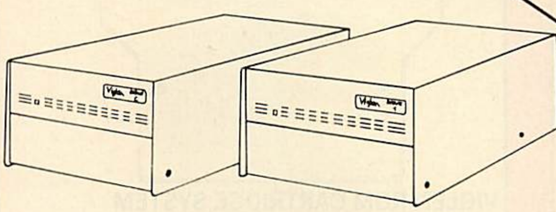
Stock Code		
V0899	Programmable Security Device	£129.95

Please add £6.00 for insured courier delivery.

WINCHESTERS

MEGA BYTES FOR MINI BUCKS

NEW LOW PRICES



Plug in 20 to 112 Megabytes of extra storage with the Viglen Winchester system.

The Viglen Winchester is ready to plug in and use on a BBC Master micro; for a BBC B or B plus you will merely need to fit the Acorn ADFS Rom. The Winchesters are 100% compatible with the Acorn Winchester and Acorn ADFS and will also work with the Acorn Master 512 board with DOS plus.

Drive 1 Winchesters are also available for backup or just more storage and simply plug into the back of the Drive 0 unit.

The Winchester package consists of: Winchester unit (cased with controller boards, power supply and fan), Master reference Manual part 1, Winchester user guide and Winchester utilities on disc (such as formatter, verifier, ADFS menu and sophisticated backup program allowing you to make fast backups on DFS discs, ADFS discs or Drive 1 Winchester.)

Stock Code	Description	Price inc. VAT
Drive 0 Single		
V150	VB20 20Meg Viglen Winchester	£649.00
V152	VB28 28Meg Viglen Winchester	£699.00
V155	VB40 40Meg Viglen Winchester	£1045.95
V156	VB56 56Meg Viglen Winchester	£1119.95
Drive 1 Second Drive		
V160	VB120 20Meg Drive 1 Winchester	£549.00
V162	VB128 28Meg Drive 1 Winchester	£599.00
V165	VB140 40Meg Drive 1 Winchester	£819.95
V167	VB156 56Meg Drive 1 Winchester	£899.95
V503	Acorn ADFS Rom and Manual (Only necessary for BBC B or B Plus	£29.95

Please add £8 for insured courier delivery.

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THE VIGLEN RANGE

PRINTER STANDS



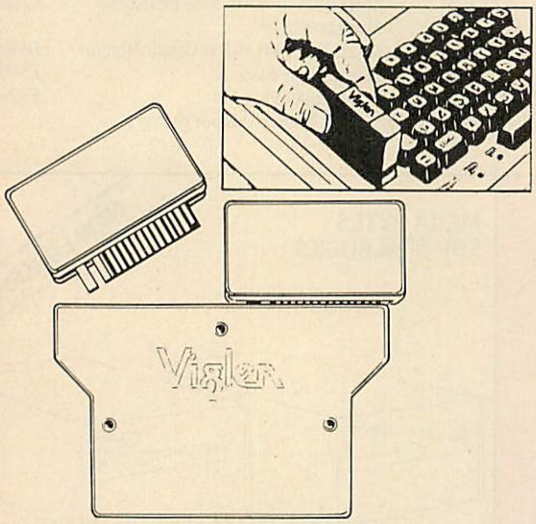
NEW LOW COST PRINTER STAND

The Viglen low cost 80 column printer stand is made in high impact ABS plastic colour matched to most printers. It raises the printer high enough to put continuous stationery (up to 1000 sheets) underneath.

Stock Code	Description	Price inc. VAT
V492	Viglen low cost 80 column printer stand (15" × 14" × 5")	£12.95

Please add £3.00 for postage and packing.

CARTRIDGE SYSTEM



VIGLEN ROM CARTRIDGE SYSTEM

Having fitted the Viglen Rom cartridge system to your BBC, Master or Master COMPACT, you can plug in your Roms/Eproms simply by inserting each one in a Viglen cartridge and plugging in whichever cartridge you want to use. The same Viglen cartridge can be used on all the micros mentioned and there is no need to switch the micro on and off between cartridge changes.

The Viglen cartridge system for the BBC micro consists of the cartridge cable assembly and socket, blanking off plates, 1 cartridge and cartridge storage rack. The cartridge socket when fitted protrudes from the rectangular slot on the left of the keyboard where the cartridges are subsequently inserted. It is simple to fit and requires no soldering.

The Viglen cartridge system for the Master and Master COMPACT simply plugs into your Master cartridge slot (or COMPACT expansion port) and accepts two Viglen cartridges. On the Master you can plug in up to two Viglen cartridge systems thus giving you access to 4 Viglen Cartridges simultaneously. The system comes complete with 2 cartridges and cartridge storage rack. On the Master you can also use Viglen cartridges which have 32 and 64K paged Roms inserted.

Stock Code	Description	Price inc. VAT
V560	Viglen Rom cartridge system for BBC	£12.95
V559	Viglen Rom cartridge system for BBC (low profile)	£12.95
V550	Viglen Rom cartridge system for Master	£14.95
V561	Single Viglen cartridge	£3.99

Please add £2.50 P & P (£00.50 for single cartridge).

CONSOLE SYSTEM

MASTER TRANSFORMATION



Give your BBC Master micro the professional PC look by replacing your existing lid with this smartly styled package. The system is strong and constructed in high impact ABS colour matched to the BBC Master and it gives your Master a very neat and impressive look.

* Will support monitors including up to 16" TV.
* Can house two 5 1/4" disc or Winchester drives.
* Capable of housing 3 1/2" drives.
* Will accept Acorn cartridges and the Viglen Master Cartridge system.
* Full internal metal screening.
* Also available with fitted drives (5 1/4", 3 1/2" or Winchester) or as a complete system including the Master.

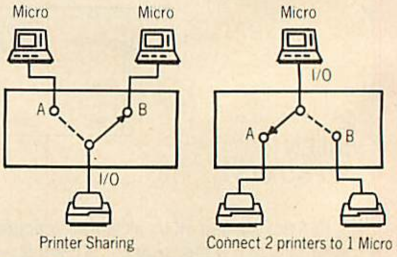
The Master console unit system package includes:
Remote keyboard case with cable.
Metal screened main unit casing including internal fittings for 5 1/4" drives.
Two switches which can be used for 40/80 track switching and can be either fitted on the front or rear of unit.
Two blanking plates to blank out any drive aperture that is not used.
Full labelling kit.
Fully illustrated fitting instructions.

Stock Code	Description	Price inc. VAT
V861	Viglen Master Console unit	£59.95
Accessories for the Master Console unit		
V853	Dual Drive data cable for console unit	£14.95
V854	Dual Drive power cable for console unit	£7.95
V855	Power supply for the console unit	£32.95
V866	Fan Kit for console unit	£34.95
V858	Fitting bracket for 3 1/2" drive	£8.95
	Fitting service available from	£15.00

Please add £8 for insured courier delivery.

SWITCHES

2 WAY PRINTER/ DATA SWITCH



The Viglen 2 Way Printer/Data Switch allows you to connect two printers to one computer or two computers to one printer, and to switch between them. All lines are switched (unlike other models) and hence the switch can be used with a combination of any type of computer and printer (or modem, or terminal, or any other data product).

All sockets on the parallel switch are centronics 36 way, female type. Serial versions are also available with 25 way "D" type, female sockets.

* Compact size 7³⁄₁₆" × 5" × 2". * Push Button Operation.

Stock Code	Description	Price inc. VAT
V2000	PAB2 Parallel 2 Way Printer/Data Switch	£49.95
V2001	SAB2 Serial 2 Way Printer/Data Switch	£59.95
CABLES		
V0493	36 Way Centronics to Centronics cable	£ 9.95
V0494	25 Way D Type Serial to Serial cable	£10.95
V0495	BBC to Centronics Cable	£7.95
V0496	BBC to 25 Way D Type Serial Cable	£15.95
V0498	IBM PC to Centronics Cable	£19.95
V0499	IBM PC to 25 Ways D Type Serial Cable	£19.95

Please add £2.50 for postage and packing.

THE VIGLEN RANGE

DISC DRIVES

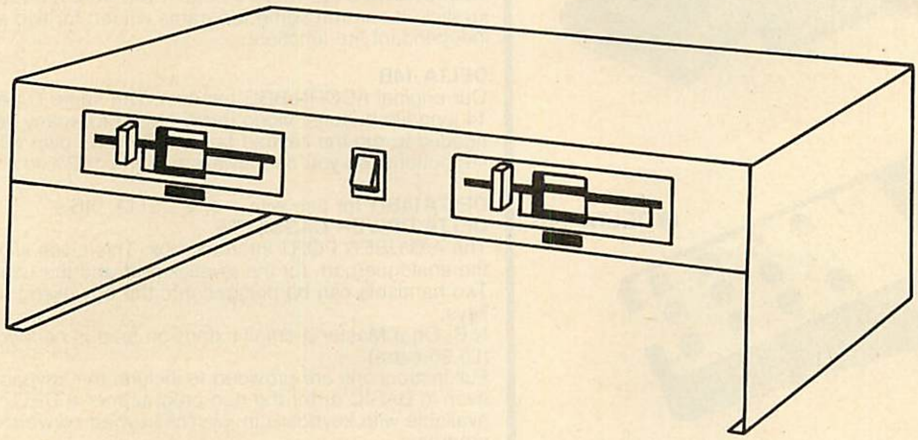
★ 3 YEAR WARRANTY
★ FRONT PANEL SWITCHING
★ CONFORM TO BS415
★ FULL RANGE AVAILABLE NOW
★ 800K DUAL DRIVE
★ PRICES FROM £134.95 *Inc. VAT*

Direct disk drives are manufactured to the highest standard using high quality Japanese mechanisms. All drives are supplied complete with user manual and utility diskette.

Stock Code	Description	R.R.P.
SP 029	Bridge Unit	£299.95

JUNE SPECIAL OFFER £249.95

DIRECT MASTER BRIDGE UNIT



SEND OFF YOUR ORDER NOW!

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THE COMPLETE FLEET STREET EDITOR

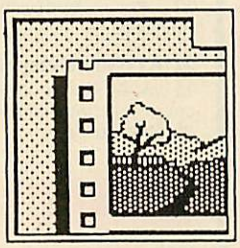
FLEET STREET
CITY OF LONDON EC4
Editor

Whatever type of printed material you need to produce – whether it's a school magazine, worksheets, newsletters, posters, notices or for class project work – Fleet Street Editor gives you the tools you need to create a whole range of attractively-presented literature.

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The different stages in newspaper and other types of print production processes are represented by the 6 different "departments" in the program.

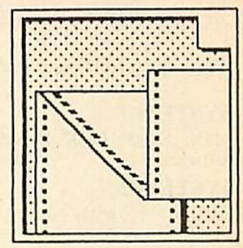
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– a collection of ready-to-use graphic symbols and illustrations.



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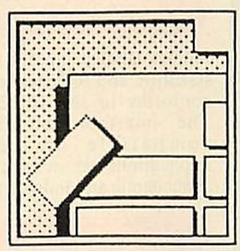
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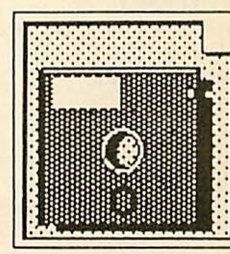
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- ☐ Network
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- ☐ Master Compact
- ☐ Add-on disks
- ☐ Amstrad PCW
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Master FS Utility Disc	£17.25 (d)		

ACW/CO-PROCESSOR

For full specification see page 5

32016 Co-processor	£999 (a)
Cambridge Workstation	£3450 (a)
X25 Gateway	£2175 (b)

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TWM2 for two computers.	£99 (b)
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***Details on Technomatic Winchesters** on page 6*

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Allows BBC computer to control any scientific and technical equipment that conforms to the IEEE488 standard. The interface can link upto 14 compatible devices. Typical applications are in experimental work in academic and industrial labs.	£265 (a)

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Converts your computer into a teletext receiver.	£95 (b)
BBC Publications rom for enhanced Teletext Utilities.	£7.95 (d)

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EPSON FX1000 An enhanced version of FX105. Call for details.	£449 (a)
EPSON EX800 See details on page 5.	£409 (a)
Colour option for EX800/EX1000.	£59 (b)
EPSON LQ800 See details on page 5.	£439 (a)
EPSON LQ1000 As LQ800 but wider carriage for 136 columns.	£589 (a)
TAXAN KP815 Enhanced KP810 with 160cps and full IBM compatibility.	£269 (a)
TAXAN KP915 Enhanced KP910 with 180cps and full IBM compatibility.	£369 (a)
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BBC Screen dump for Integrex.	£525 (a) £15 (d)
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GRAPHICS WORKSTATION	£599 (a)

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A4SM PLOTMATE	£450 (a)
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Serial Printer Lead (1.2m).	£7 (d)

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2 Computers 2 Printers X-over 36v36-x	£69(c)		25v25-x	£65(c)
BBC Cable set 3 to 1 (1m ea)	£32(d)			£34(c)
BBC Cable set 4 to 1 (1m ea)	£39(d)			£41(c)

BBC Computer Sharer: TCS26 1 computer to 2 printers fitted with BBC cable	£22 (c)

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TM Version plus Mouse	£105 (c)
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for Acorn, Torch & Multiform Z80 Processors

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Send for details on our full range of CP/M & PC DOS packages for Business, Communications & High Level Languages.

*All software supplied by us is known to operate with the appropriate Acorn Disc filing systems. We **cannot** comment on their use with other DFS systems.*

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WORDWISE PLUS	£38 (d)
WYSIWYG PLUS	£21 (d)
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MINI OFFICE II (ROM)	£48 (d)

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(b) £2.50
(c) £1.50
(d) £1.00

PRINTER ACCESSORIES

EPSON ACCESSORIES:
Interfaces:
8143 RS232 .... £30 (d)
8148 + RS232 + 8K .... £65 (d)
8165 IEEE + Cable .... £65 (d)
8132 Apple II .... £60 (d)
8177P NLQ for FX80 + /FX100 + ... £99 (d)
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FX80/80 + /85 Tractor Attachment .... £29 (c)
LX80/86 Tractor Feed .... £21 (c)
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H180 HP GL Emulation Rom + Ram .... £63 (c)
H180 Printer Emulation Rom .... £38 (c)

SHEET FEEDERS:
8338 LX80 .... £52 (b)
8333 FX100 + /105 .... £169 (a)
8331 FX80 + /85 .... £129 (b)
LQ800 .... £135 (b)
LQ1000 .... £179 (b)
EX800 .... £135 (b)
EX 1000 .... £309 (b)
FX 800 .... £135 (b)
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RX/FX80/80 + , FX85 .... £4 (d)
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FX100 .... £7.50 (d) KP910 £7 (d)

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Aqueous Pen Set six pens .... £18.50 (d)
Oil Based Pen Set six pens .... £25.00 (d)

TAXAN CANON Accessories:
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Ribbon, KP810/815/910/915 .... £6 (d)

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NL10 RS232 Interface .... £69 (c)
NL10 IBM Type Interface .... £39 (c)
NL10 Ribbon .... £4.50 (d)

National Panasonic KX P1080/81
Spare Ribbon .... £4.50 (d)
Serial Interface .... £39 (c)
KXP3131 Tractor .... £90 (a)
KXP3131 Sheet Feeder .... £189 (a)

JUKI 6100
RS232 Interfaces .... £65 (d)
Tractor Feed .... £149 (a)
Ribbon (Carbon) .... £2.00 (d)
Spare Daisy Wheel .... £14 (d)
Sheet Feeder .... £182 (a)

BROTHER HR20
Daisy Wheel .... £18 (d)
Tractor Feed .... £116 (a)
Spare Ribbon Nylon .... £3.00 (d)
Spare Ribbon Carbon .... £4.50 (d)

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Spare Ink Cartridge Colour .... £15 (d)
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Other lengths can be supplied on order:
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Labels/1000:
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WYSIWYG PLUS

WYSIWYG PLUS is a printer and screen utility for Wordwise Plus, View, Interword, and Basic users, supplied on a 16K Eprom. To obtain a particular printer effect, such as enlarged text, it used to be necessary to discover the appropriate 'printer control code' from your manual and incorporate it into your text. Secondly, you had to print several trial copies in order to position the effect correctly in relation to the rest of your text.

WYSIWYG PLUS simplifies this trial and error approach using easily remembered *commands. For example, *ENLARGED not only selects enlarged text on your printer, but uniquely shows you double width characters on your screen, even from within Wordwise Plus!

WYSIWYG PLUS incorporates a logo editor. Just draw your design on screen using the arrow keys, and save the results. Use the *GRAPHICS command to incorporate your design anywhere in your text; position and see your design in your text before faithfully reproducing a hard copy.

There is also special help for daisy wheel users. The *WHEEL command will prompt you to change daisy wheels whenever a change in type style is about to occur.

WYSIWYG PLUS is designed to work with the following systems:

BBC Model B
BBC Model B+
BBC Master 128
BBC Compact

6502 Second processor,
Turbo coprocessor
All printers (Except lasers)

WYSIWYG PLUS workspace is relocatable.

WINDOWMATIC

All users of Acorn's VIEWSHEET speadsheet program will be aware of its powerful windowing facility which allows the screen and/or printer to be configured in up to 10 seperate windows taken from anywhere in the sheet. They will also be painfully aware of how difficult and time consuming it is to set up a required display. Although VIEWSHEET allows configurations to be saved to the media, it does not have provision for deciphering them.

WINDOWMATIC has been produced with the intention of rectifying these shortcomings and to bring out the very best from VIEWSHEET.

WINDOWMATIC provides a quick and easy way to configure screen and printer allowing complicated documents and reports to be set up much more easily. It displays complete text information on all 20 windows and accurate graphic representation of the screen and printer output.

The package includes a screen dump routine for Epson printers and allows use of other printer dump packages.

WINDOWMATIC is compatible with BBC Master and BBC B+. A 6502 2nd processor must be fitted to a model B to run Windowmatic. Windowmatic is fully compatible with Turbo and 6502 2nd processor.

The program is supplied on disc with a comprehensive manual.

VU-TYPE

Do you have finger trouble when typing?
Do your letters look like this?
Dear Sor,
I wuold like to .....
then you need:
VU-type, a complete touch typing program produced by BBC/Pitman.
It allows you to learn at your own pace and has a wide range of exercises. Screen displays show the keys you have pressed and it will report on your speed and accuracy.
Supplied on a 40T Disc with a manual.
Available at a special price of £7.50(d)
instead of the usual £15. Offer valid while stocks last

EDUCATIONAL/FUN SOFTWARE BUNDLE

Wordmover
Wordplay
Pantry Antics
Drawstick
Locomotion

These programs are supplied from the BBC Publications Educational Software range and will be supplied on a 5.25" disc for BBC Master, B+ and B and on a 3.5" disc for the Compact.

5.25" Disc £17.50(d)
3.5" Disc £18.50(d)
(Normal RRP over £40)

BOOKS

No VAT Carriage Code (c)

LANGUAGES
6502 Assy Lang Prog £19.95
6502 Programming £13.95
8086 Book £23.95
Acorn BCPI User Guide £15.00
Acorn FORTH £7.50
Acorn LISP £7.50
Acorn ISO Pascal Ref Manual £10.00
Intro to COMAL £10.00
Intro to LOGO £7.50
Micro Prolog Ref Manual £10.00
Introduction to Turbo Pascal £14.95
Prog the Micro with Pascal £8.50
The Supervisor's BBC Micro £10.95

BBC MICRO GUIDE BOOKS
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Maths Prog in BBC Basic £7.95
The Friendly Computer Book £4.50
Toolbox 2 .... £10.95

PROGRAMMING/UTILITY
Advanced Sideways Ram User Guide £9.95
Advanced User Guide (BBC) £15.95
Applied Assembly Language on the BBC £9.95
BBC Micro Advance Programming £9.95
BBC Micro Ref Guide (B Smith) £10.95
BBC Micro Sideways ROM's RAM's £9.95
Guide to the BBC ROM £9.95
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Mastering Assembly Code £8.95
Mastering Interpreters & Compilers £14.95
Mastering View, Viewsheet & Viewstore £12.95
View 3.0 User Guide £10.00
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Disc Book £3.50
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Disc Systems £6.95
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Discovering Disc Drives .... £POA
Practical Disc File Techniques £5.95
Mastering the Disc Drive £7.95
Mastering DOS plus £12.95

APPLICATIONS
Interfacing Proj for BBC £6.95
BBC and Small Business £5.75
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TECHNOMATIC
BBC COMPUTERS & ECONET CENTRE
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305 Edgware Road, London W2 Tel: 01-723 0233

NOVACAD
Computer Aided Draughting for the BBC Micro

"Novacad can drive a plotter to provide drawings of a high quality… Novacad is excellent. It is flexible, genuinely easy to operate without much practice, and a pleasure to use." **Beebug December 1986**

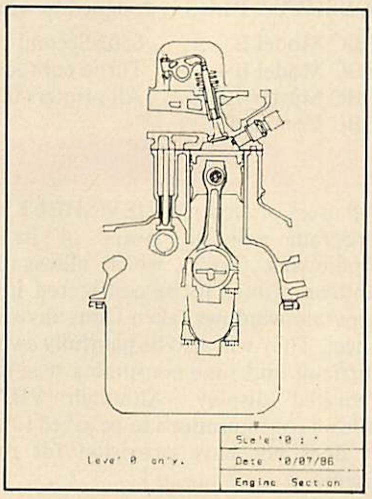
"Novacad is a professional package, well worth the £90 for the ROM and disc and is expandable to suit your own particular requirements. I would have no reservations if I heard Novacad called, "the best on the market"." **A&B Computing August 1986**

A sophisticated CAD package with unique facilities which are generally confined to the professional CAD packages costing thousands of pounds.

NOVACAD is being used in widely differing fields ranging from leading British industries for producing engineering drawings to Accountants' offices for producing flow charts. Architects, engineers, plumbers, kitchen planners and many other professions requiring easy to use facilities for producing professional quality output are making extensive use of NOVACAD's unique features. NOVACAD is proving to be a invaluable teaching aid in technical schools and colleges simply because of the ease with which it can be used.

NOVACAD'S MAJOR FEATURES

* Simple and easy to use with logical command sequence.
* A large drawing area (approx 15 screens).
* The ability to create complex icons (upto 500 lines instead of the usual 15 to 20 pixels), store them in a library and recall them at different scales and orientations.
* A zoom facility allowing magnification of up to 20 times to insert finer details.
* Block copy of shapes on the screen for repetitive use.
* Text entry at any 90° orientation at any position on the screen.
* Create multi layer drawing with 8 levels available.
* Full compatibility with the BBC range with minimal hardware requirements yet having the capability of exploiting the potential of the extra shadow memory or the second processor's memory and speed.
* Printer routine for Epson 80 and 136 column printers.
* A unique optional facility to output to any BBC compatible plotter.
* Cursor control from keyboard, tracker ball or mouse.



NOVACAD package includes a 16K ROM, Utility disc and a comprehensive manual.

MINIMUM HARDWARE REQUIREMENTS

- **Any BBC range computer with Acorn DFS.**
- **40 Track single sided single drive.**
- **Epson compatible dot matrix printer.**

With basic BBC B, NOVACAD operates in mode 4 allowing use of any 2 colours. With shadow memory of the BBC+ or the Master, it can also operate in mode 0 for higher resolution or mode 1 for allowing use of any 4 colours, and it will provide additional user memory for more complex drawings.

6502 second processor or the Turbo on the Master will also increase the drawing speed considerably.

OPTIONAL EXTRAS

Plotter driver generator is available as an optional extra to configure a plotter routine for any BBC compatible plotter. Pre-configured programs for the popular plotters like **Epson HI 80, Hitachi 672, Plotmate, Penman** and **HP GL.** This program allows the drawing to be scaled to the maximum plotter size thus enabling drawing of A2 and A3 sizes to be produced with equal ease. The zoom facility will enable inaccuracies of drawing on the screen to be eliminated.

ROUTCAD, an optional software package for our Graphics Workstation allows for production of shapes drawn using NOVACAD in 3D on suitable material and is ideal for a range of applications including template making and model building.

EpromRyter

A powerful eprom programmer for use with the BBC Master. It offers the latest 'state of the art' programming techniques to provide fast and efficient operations.

The software is totally menu driven and on screen help messages make the programming simple for both specialists and novices alike.

The EPROMRYTER interfaces with the Master through 1 MHz bus. It is mains powered with its own psu. 3M Textool zif socket has been fitted to ensure consistent and reliable service over long periods.

The single rail eproms handled by the EpromRyter are:
- 2716 2732 2764 27128 27256 27512 27513 27011 2516 2532 2564 (NMOS & CMOS)
- One time eproms P27XXX, 87CXXX etc.
- Also A suffix eproms such as 27XXXA

The main features of the programming software are:

* Device, function and voltage selection from the computer keyboard.
* Continuous display of the options selected.
* All eproms upto 27512 (64K) programmed in single pass.
* Automatic Intelligent identifier support for eproms able to respond.
* Selectable programming voltage 25/21/12.5V
* 3 programming methods: Normal, Intelligent & Pulse (20 sec for a 27128).
* Serial port protocols supported.
* Intel HEX, Motorola S, HEX and ASCII protocols supported.
* DFS, NFS, ADFS and Rom Filing System Supported.
* BASIC/Machine Code programming using RFS.
* Powerful editor with input in HEX or ASCII. * Full editable 64K file.
* Block move of data within the address range.
* User can select any section of the eprom from single byte to the full address range to blank check/burn/verify. Facility to program single bytes makes program development/amendment simpler.
* Multiple loading for ROM Filing System

Some of the above features apply to Master Computers only

EPROMER II

A proven Eprom programmer for BBC Model B and B+ with thousands in use in industry, educational and R&D establishments. It offers many of the powerful features of the EpromRyter and can program all single rail eproms upto 27256. Full details on request.

TECHNOLINE
(24 hr viewdata system)
Tel:01-450 9764

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Telex:922800

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(close to Dollis Hill ⊖)
West End Branch
305 Edgware Road, London W2
Tel:01-723 0233
(near Edgware Road ⊖)

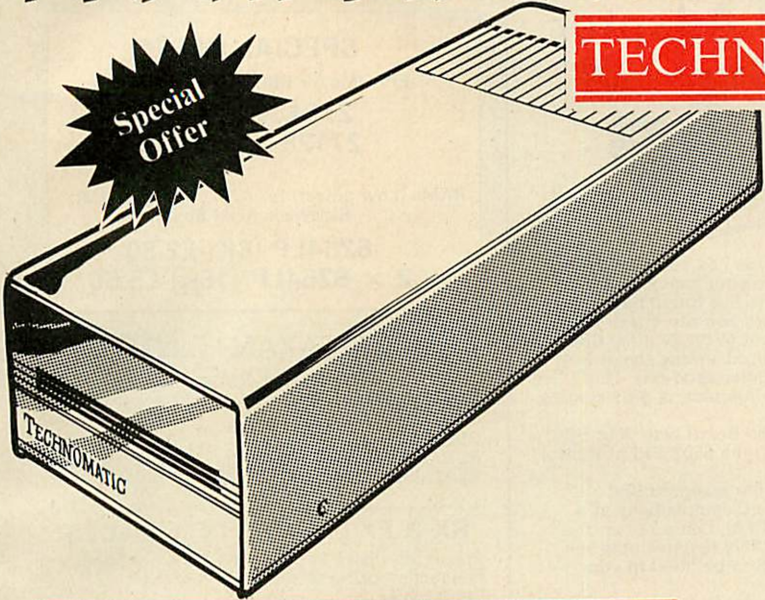
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(b) £2.50
(c) £1.50
(d) £1.00

A PRICE BREAKTHROUGH



TECHNOMATIC WINCHESTERS

* Cased with power supply and cooling fan
* 1 MHz bus extension cable
* Fully compatible with Acorn ADFS and FS III
* Fully compatible with S.J. Research file server
* 12 months warranty

10 Mbyte £399 (a);

(This offer valid whilst current stocks last)

Special Adaptor for S.J. Research File Server **£28**

3½ DISC DRIVES

* 400K/640K capacity per drive in DFS/ADFS modes
* Mitsubishi 80 track double sided ultra low power, fast access mechanisms
* The drives are supplied fully cased and with cables ready for connection to a computer
* Drives powered from the computer * 2 years warranty

Single Drive £75(b) Dual Drive £134(b)

FREE MASTER OFFER

Every Master and Master Compact purchased at our usual price will include the following:
An educational/fun bundled software package comprising of **VU-Type, Wordmover, Wordplay, Drawstick, Locomotion and Pantry Antics**

META Version III

"All the good features you would expect to find in a good source code editor are present . . . Meta assembler lives in a different world. It is structured to work with any new processor . . . as new instruction sets can be added . . . as needed . . . has a well featured editor with colour highlighting, a sound modular approach." **Acorn User October 1986**

- Assembles for over 30 popular processors, including Z80, 6800/01/02/04/05/09/11 etc — and 68000 — using native mnemonics for each processor, eg. LD A, (HL) for Z80 and MOV AO, $1000 for 68000 etc.
- Fully integrated Editor: four field, all search, search/replace, block copy, delete, move, marked save, load etc.
- Compatible with Portal Eprom Emulators and Team Disassemblers.
- Send object code in Intel Hex, S-Record, straight binary etc. down to discs, RS232, parallel port, Eprom Emulators etc — all **during Assembly.**
- Over 50 directives included as standard: handling nestable macros, conditional assembly and twenty types of table definition directives.
- 32 bit labels; 31 character names. Arithmetic and Boolean arithmetic to 32 bits.
- Modular source code with numeric and string parameter passing.
- Serial communicator area with eight options lines: echo, control code trap, LF supression/addition etc.
- Over 500 in use throughout the world in universities and many different industries.
- Two 16K Roms, two 80 track discs, A4 ring-band manual, function-key strip.

PORTAL EPROM EMULATORS

- Emulates 2716, 2732, 2764, 27128, 27256, 27512 eproms at 150ns Access time.
- Load at 4Kbytes/second — No "erase" time.
- 28 pin header plugs into Eprom socket on target system — status monitored on 13 Leds.
- Fully software controlled from Meta Assembler.
- 100 times faster than standard EPROM program/erase cycle.
- Fully CMOS compatible; draws no power from target system.
- Four portals may be independently programmed off same user-post cable.
- Complete with all cables, manual and disc.

PORTAL 512 (2716, 2732, 2764, 27128, 27256, 27512).

TEAM DISSASSEMBLER

The third part of the Universal Development System: a Meta labelling dissassembler.

Supports 1802, 8080, 8085, HD64180, Z8C, 65XX (includes 65 col, 6511 etc), 68XX (includes 00, 01, 02, 03, 08 etc):

- Up to 64K of object code translated back into META compatible source code modules: labels automatically inserted on all jump targets, memory references etc.
- Pre-editing stage allows marking of object code areas as byte, string, word, long word etc, tables. These areas dis-assembled into appropriate directives instead of garbage mnemonics.
- Reconstituted source code ready for immediate re-assembly by META.
- Omniversal search/replace for re-naming arbitary label names with meaningful ones.

IT'S NEW, IT'S FREE! THE TECHNOMATIC BBC CATALOGUE

This advertisment can only show an example of the range of products stocked by Technomatic. That's why you should send for our latest BBC catalogue providing detailed information and prices on BBC Computer Systems, Peripherals, Software and Books.
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BBC MASTER 128K Micro	£395
BBC MASTER TURBO 4MHz	£493
512K Processor Add on Board "inc. Mouse and GEM package"	£195

SPECIAL OFFER

FREE . . . £80 worth of Software

Gemini's OFFICE MATE & OFFICE MASTER packages on Disc consisting of: Database, Spreadsheet, Beebplot graphics. Accounts packs: Cashbook, Final Accounts, Mailist, Easyledger, Invoice & Statements, Stock Control and Acorn's popular ***MUSIC 500*** *Unit with every BBC Master 128K Micro bought from us.*

BBC MASTER COMPACT

All Master Compact Microcomputers are supplied complete with an integral 3½" Disc Drive and various educational and professional bundled softwares.

System 1	Standard Package	£385
System 1A	System 1 + TV Modulator	£399
System 2	System 1 + Green Hires Monitor	£469
System 3	System 1 + Medium Res Colour Monitor	£599

RS232 Kit for BBC Compact	£26
Additional 3½" Drive for BBC Compact	£99
Turbo 65C102 Add-on Module	£99
BBC MASTER ET (Econet Terminal)	£315
Econet Module for the Master	£43
ROM Cartridges for Master	£11
Reference Manual I	(No VAT) £14
Reference Manual II	(No VAT) £14
Advance Ref. Manual	(No VAT) £19
64K Upgrade Kit for B+	£32
Acorn 1770 DFS Kit complete	£42
ECONET Upgrade Kit for BBC	£42
ALL ECONET UPGRADES Available	
Z80 Acorn 2nd Processor package	£325
ARIES' Professional IEEE Interface	£265
Acorn IEEE Interface Complete	£280
Acorn Teletext Adaptor	£95
Acorn Bitstick I	£299
Robocom Bitstick II	£759
Upgrade for Bitstick I to II	£450
Bitstick Multiplotter Driver	£65

(Securicor carriage £7)

CENTRONICS GLP & Brother M1009 (NLQ) Printers

A major price break-through in NLQ Printers from Watford.

At last, a low cost full feature printer, supplied complete with Watford's own NLQ ROM (separately at no extra cost). Due to Watford's bulk purchasing power and low margins we can now offer this incredible printer deal direct from the manufacturers to our customers.

Features include, Epson RX Compatible commands, Near Letter Quality print, 50 CPS Draft mode, Centronics parallel interface, Single, Double & Quadruple density graphics modes, Subscript & Superscript, handle up to 9½" wide standard paper, Friction Feed standard, Low cost Tractor feed optional extra, Bi-directional logic seeking.

Special Offer ***£95*** *(carr £5)*
Tractor Feed Attachment ***£12***

CO-PRO Adaptor



Now for the first time you can add the Master Co-processor boards, to your standard BBC model B, or B Plus. With this brand new launch from Watford Electronics you can attach any BBC Master co-processor to the original BBC Micro. Once again Watford strides ahead with a new concept in BBC B Micro add-ons. This unique external Co-Pro Adaptor, is protected by patent applications.
Use the super fast Turbo Board with your BBC B, it is much faster than the 6502 2nd processor superseding it.
With the 512K addon your standard BBC machine achieves IBM PC compatibility at a realistic price running GEM, Lotus 123 and many other programs. This requires both the 1770 DFS and the ADFS to be fitted to your computer.
To use other co-processors you require a BBC B with DNFS 1.20 or higher, or BBC B+ fitted with 1770 DFS 2.20 or greater. Co-processors work exactly like a second processor.
Master owners may use Co-Pro to add a second Co-processor externally.
Watford, brings power to your BBC at only:
£50.00 (carr £5)

VARIOUS PRINTERS

● FX80/85 Tractor Feed	£35
● EPSON FX800 Printer	£315
● EPSON Hi-80 Printer Plotter	£229
● Hi-80 Refils, set of 4 Pens	£6
● EPSON Paper Roll Holder	£17
● EPSON LX86 Printer	£199
● EPSON LX80/86 Tractor Feed	£20
● EPSON LX80/86 Sheet Feeder	£49
● EPSON FX800 Printer	£315
● EPSON FX1000 Printer	£439
● EPSON EX800 Printer	£405
● Colour option for EX800/1000	£55
● EPSON LQ800 Printer	£439
● Centronics Printer Cable to interface all the above Printers to BBC	£6

(Securicor carriage charge on printers £7)

PRINTER SHARERS

(Ideal for School environment)

Connect 3 BBC Micros to 1 Printer	£60
Connect 6 BBC Micros to 1 Printer	£99
PRINTER CHANGER	
Connects 3 Printers to 1 Micro	£65

(Cables extra)

Acorn-Olivetti JP101 Spark Jet Printer

One of the main problems with most printers is that they are hopelessly noisy. How often have you wanted to print something late at night but not done so for fear of waking the children? Also ideal for those working in quiet environments such as libraries, etc. Silence the complaints with the serious solution from Watford at the amazing cost of only **£59**

Pack of 4 refills **£10**

JP101 accepts 9½" standard fan fold paper or single A4 sheets. Tractor & Friction feed supplied as standard – print speed 50 cps.

SPECIAL OFFER

EPROMs for BBC's Sideways ROMs.

2764-250nS £2.90
27128-250nS £3.25

RAMs (Low power) for ATPL, WATFORD, etc., Sideways ROM Boards

6264LP (8K) £2.80
2 × 6264LP (16K) £5.50

KAGA/TAXAN PRINTERS

(IBM/Epson compatibles)

Kaga KP815 Printer	**£269** (carr £7)
Kaga KP915 Printer	**£369** (carr £7)
RS232 Interface	£49
RS232 Interface with 2K Buffer	£69
RS232 Interface with 16K Buffer	£89

RX & FX PRINTER INTERFACES

Epson interfaces fit inside the printer to allow connection using techniques other than Centronics.

RS232	£27	RS232 + 2K Buffer	£55
IEEE 488	£65	RS232 & 8K Buffer	£75

PRINTER LEADS

Centronics lead to connect BBC micro to EPSON, KAGA, SEIKOSHA, NEC, STAR, JUKI, BROTHER, SHINWA etc. printers.

Standard length (4 feet long)	£6
Extra long (6 feet long)	£8
Compact's Special Centronics Lead	£9
RS232 Cable	P.O.A.
IBM Parallel 1 metre Cable	£12

PRINTER RIBBONS & VARIOUS DUST COVERS

Type	Ribbons	Dust Covers
BBC Micro	–	£3.50
BBC Master	–	£4.00
Brother HR15	£3.00	-
FX100	£7.00	-
FX80-MX80-FX85	£4.50	£4.95
RX80	£4.50	£4.50
LX80	£4.00	£4.50
GP80	£4.50	£4.00
Centronics GLP	£4.00	£3.75
KAGA KP810	£5.25	£4.75
CANON PW1080	£5.25	£4.75
Panasonic KX1080	£7.75	£4.75
Microvitec Metal Monitors	–	£5.50

Our attractive Dust Covers are manufactured from translucent PVC. The seams are stitched and edges are taped to prevent splitting due to continuous use.

Listing Paper (Perforated)

1,000 Sheets 9½" × 11" Fanfold Paper	£7
2,000 Sheets 9½" × 11" Fanfold Paper	£12
1,000 Sheets 15" × 11" Fanfold Paper	£9
Teleprinter Roll (Econo paper)	£4

Carriage on 1,000 Sheets £1.50

PRINTER LABELS

(On continuous fanfold backing sheet)

1,000 90 × 36mm (Single Row)	£5.00
1,000 90 × 36mm (Twin Row)	£4.90
1,000 90 × 49mm (Twin Row)	£7.50
1,000 102 × 36mm (Twin Row)	£6.25

Carriage on 1,000 Labels £1.00

NEW

Panasonic KX-P1081

(Now IBM Compatible)



from the prodigious Japanese Stable of Panasonic comes this fabulous new NLQ Dot Matrix Printer

Available NOW at a superbly realistic price, the KX-P1081 perfectly balances features, quality of construction and Value for Money to produce the printer of tomorrow, here today, ready to sweep the current generation of machines away.

Ingenious innovation in terms of software control codes permits great flexibility when it comes to defining the print style. A nippy **120 cps** of clear Draft text backs up the crisp 24 cps Near Letter Quality text mode, with upto 40 superbly useful downloadable characters. A delightful range of assorted character widths is efficiently supported, with sizes ranging from a broad 5 cpi to petite 17 cpi, EVEN in NLQ mode. Some of the extensive support for serious use includes specialised functions to perform justification, centering and even left and right ranging. Proportional spacing permit even greater freedom when it comes to advanced use. Not only is the full Epson RX compatible control code set implemented, but extra codes have also been added to cater for the NLQ options, etc.

A full 96 ASCII character set is supported, with an extended set of 32 international characters and IBM special characters as well as IBM block graphics characters. A 1K Print Buffer alleviates much of the wait time normally associated with printing, whilst the bi-directional logic seeking print head takes the quickest route to print as required.

The draft text is implemented with a 9 × 9 matrix, with Near Letter Quality effected by means of an 18 × 18 matrix.

(Price inlludes, FREE A 4ft Printer Lead, and a Dump Out 3, Screen Dump ROM worth £35 with every printer purchased from us).

Special Price: **£149** (carr. £7)

Panasonic RS232 Interface: **£39**

Panasonic KX-P3131 Daisy-Wheel Printer

A few months ago, we introduced the KX-P1080 to our large and discerning customer base. As a result of the enthusiastic and overwhelming reaction to this versatile dot matrix printer (see above for details), we are now extremely pleased to be able to bring you details of the fabulous KX-P3131 Daisywheel Printer, also from Panasonic. The KX-P3131 printer is the ideal printer for the home user wishing to produce clear, immaculate letters or reports.

Ideally suited to the pocket of the home user, costing not much more than a pair of disc drives, this daisywheel printer delivers flawless text at 10, 12 or 15 characters per inch. It also supports proportional print mode.

Printing at a respectable 17 characters per second, the KX-P3131 features a capacious 6 kilobytes printer buffer to swallow most printing requirements with ease. For the more demanding user, there is a 32 kilobytes printer buffer option available. Taking paper up to 13.5" wide, the KX-P3131 prints with bidirectional logic seeking, ensuring the minumum time to print your text.

Only **£218** (carr. £7)

Single Sheet Feeder	**£195**
Tractor Feed	**£90**

256K PRINTER BUFFER Only: £149

(For full details on this extremely versatile, low cost – high performance Mega Printer Buffer please refer to page 3 of our advert.)

Printer Stand Type-YU-S25



This new professional printer stand takes hardly more space than your printer. Due to the positioning of the paper feed and re-fold compartments ie. one above the other, the desk space required for your printer functions is effectively halved. Additional facilities include: Easy access to paper from both sides, used with both top and bottom feed paper and with its dial controlled paper feed system with adjustable deflector plates it ensures smooth paper flow and automatic refolding.

***Introductory Offer* Only £29**



We stock a range of monitors to suit all needs. Choice of a monitor is a matter of personal taste so we recommend that whenever possible, you ask for a demonstration at our shop. All Monitors are supplied complete with connecting lead.

MICROVITEC 14"

● 1431 – Medium resolution as used on the BBC television computer programme	£175
● 1451 – High resolution, suitable for word processing in mode 0	£225
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● 1451AP RGB + PAL and AUDIO	£255
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● KAGA KX1201G Hi-res Green Monitor	£85
● KAGA KX1202G Long persistence Hi-Res Green Monitor	£93
● KAGA KX1203A Ultra-Hi-Res Amber Monitor	£93
● KAGA Super Vision 2 Hi-res RGB Colour monitor. Ideal for Wordprocessing	£260
● **Kaga Super Vision 3,** Ultra Hi-res, RGB Colour) Text mode switch allows monochrome text display in Green, Amber, White reverse or White on Blue	£309
● 12" Anti-Glare Screens	£9.50

STAR BUY

● PHILIPS 14" Hi-Res, dark glass, attractively finished Colour Monitor – supplied complete with RGB, SKART and Audio/Phono connectors. A push-button switch toggles between Hi-Res monochrome green text mode and full colour display.

ONLY £209

ZENITH

"Test Bureau Recommended for use in Education"

12" high resolution monochrome monitor. Ideal for word processing as its green or amber screen is very restful to read. (These are the same professional quality, stylishly finished monitors as used in the larger Zenith PC Systems.)

Green (New Design) Hi-res	£69
Amber (New Design) Hi-res	£74
LEADS	
BNC Lead for Zenith or Philips	£3
Skart Monitor Lead	£5
RGB lead for KAGA	£3

N.B. carriage on Monitors **£7** (securicor)

SWIVEL BASES

for Video Monitors

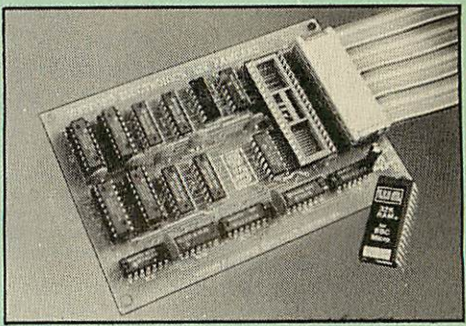
By placing your monitor on one of our superb swivel bases, you gain the freedom to adjust the monitor viewing angle to suit your needs. By doing this, you alleviate eye strain and reduce back stress.

for 12" Monitors **£10** (carr. £2.50)
for 14" Monitors **£14** (carr. £2.50)

32K

SHADOW RAM-Printer Buffer

Expansion Board



A MUST FOR WORD PROCESSING

Watford Electronics now brings you the latest state-of-the-art MEMORY EXPANSION BOARD for your BBC microcomputer. Don't throw away your BBC B for a BBC B Plus or BBC Master. Just plug the ribbon cable into the 6502 processor socket, and fit the compact board inside the computer. Immediately you will gain not 16K or even 20K, but a massive 32K of extra RAM!!!

● IMPROVE your WORD PROCESSING system, whether disc or cassette based. Don't wait for a slow printer – type in text while printing. TWO JOBS DONE SIMULTANEOUSLY and £100+ saved on a printer buffer.

● "VIEW" Wordprocessor users can now type in letters in 80 columns and have up to 28,000 bytes free – 5 times as much as normal.

● In WORDWISE (or WORDWISE-PLUS), preview in 80 columns with the full 24K of text in memory. This product is recommended as an ideal complement by Computer Concepts.

● Combine GOOD GRAPHICS and LONG PROGRAMS. Use the top 20K of the expansion RAM as the screen display memory, leaving all the standard BBC RAM free for programs. Benefit from MODE 0/1/2 graphics and 28K of program space.

● Use the FULL 32K or the bottom 12K of the expansion RAM as a PRINTER buffer for PARALLEL or SERIAL printers, sound channels, RS423 etc. Print large text files while running long graphics programs, and have all your buffer options available as well (*FX15,21,138,145,ADVAL etc). Please note only a 12K printer buffer can be used with Wordwise or Wordwise-Plus, due to the way they are written.

● Ensure COMPATIBILITY with a vast range of hardware (including our ROM board, the ATPL ROM boards, double density boards, second processors), and software (including BASIC, TOOLKIT, VIEW, WORDWISE (1.20+), WORDWISE-PLUS, Music 500's AMPLE). This is because our board, unlike those of our competitors, is connected to the computer by a ribbon cable and has the power consumption of a couple of ROMs!

● Achieve EASY OPERATION with ROM based software. A large range of commands is available for machine code and BASIC users, including some useful *HELP messages, and a comprehensive manual is supplied free.

● Unique facility to turn ROMs off and on again. Unlike all other ROM managers, this feature does not use 'unofficial' memory. Two bytes of normally user-inaccessible memory on the RAM card are used to ensure ROMs are disabled WHERE OTHER ROMS FAIL.

See next page for SPECIAL OFFER

Only £59 (carr £2)

(Price includes a comprehensive manual and the ROM)

Continued →

INCREDIBLE WORD PROCESSING DEAL ! ! !

Watford Electronics, already renowned for quality products at discount prices, are offering, the truly spectacular BARGAIN OF THE YEAR!
A Watford's 32K Shadow RAM Card – Printer Buffer and the much sought after, Computer Concepts' Inter-WORD, (a very powerful package) All this at an astounding price of:

Only £89 (carr £3)

THE EPSON RX-FX-KAGA PRINTER COMMANDS REVEALED (BOOK)

So you bought yourself a new printer, because the salesman in the shop showed you how clever it is and impressed you with all sorts of printouts to show its capabilities – he may even have offered you a special price.
However, now that you have got it home and connected it to your BBC microcomputer, you are wondering how to make it perform these magical tasks. The manual seems to give no clues, and when you type in the example programs, the computer throws the LPRINT statements back in your face.
Now what do you do, when this £400 piece of high technology refuses even to move its head, and you have stayed up until 2 in the morning with copious supplies of coffee, desperately trying to print something out. Once again, Watford Electronics comes to your help with our new book entitled 'THE EPSON FX-KAGA PRINTER COMMANDS REVEALED'.
This book describes in plain, easy to understand English, how to use and make the most of your KP810, Canon PW1080A or any Epson FX80 compatible Printer with the BBC Micro, both from Basic and Wordwise.
It describes in detail how to obtain the maximum in graphics capability from your printer and includes full indexes allowing you to cross index the numerous commands. Every command is explained in detail, with an accompanying BBC Basic program and an example of its use from Wordwise.

Superb Value at **£5.95** (No VAT)

NOW WITH EXTRA FEATURES AT NO EXTRA COST Watford's latest DFS 1.44

- Incorporates Acorn's Official Tube Host Code so that those with 2nd processors no longer need to waste a ROM socket on the DNFS.
- Option to DOUBLE the speed of BPUT and BGET.

If you already have the Watford Electronics DFS and wish to incorporate these new facilities ten simply return your existing DFS ROM to us together with £5 remittance for an upgrade. Please pack the ROM securely and address the package to our Upgrades Dept.

WATFORD's & ACORN's SINGLE DENSITY DFS

Watford's popular and widely acclaimed DFS has now been available for four years, and has gained a large following amongst serious users of the BBC Micro. Owners of Acorn or any other standard DFS can upgrade to our "Ultimate" DFS merely by replacing their DFS ROM. See below for this upgrade. ***(P.S. Watford's highly sophisticated DFS is fully compatible with Acorn DFS).***

PRICES

- *Complete Disc Interface Kit including DFS ROM and fitting instructions* **£62**
- *Acorn's 0.90 DFS Kit complete* **£57**
- *DFS Manual (Comprehensive)* *(no VAT)* **£6.95** *(P.S. Our comprehensive DFS Manual covers both Acorn & Watford DFSs).*
- *Watford's sophisticated DFS ROM only* **£16**
- *We will exchange your existing DFS ROM for Watford's Ultimate DFS ROM for only* **£12**
- *DNFS ROM only* **£17** ● *ADFS ROM only* **£25**
- *Watford's DFS is exclusively available from Watford Electronics and their appointed dealers only. Every ROM carries a special label with LOGO and serial number.*

WATFORD's DOUBLE DENSITY DFS INTERFACE

The DDFS from Watford Electronics represents a new standard in DFSs for the BBC micro. This is a double density version of our popular single density DFS, and combines all the features of this powerful DFS with the advantages of a system that gives 80% more storage per disc in double density mode. P.S. – Please note that not all DDFSs are capable of providing either the full 80% storage increase, or of allowing a file the full size of the disc – Ours allows both of these! Operates both in Single & Double Density modes.

The typical piece of games software these days is provided upon a protected disc. In order to work on any double density system (including the others on the market) a protected piece of software needs to make calls through the OSWORD &7F routines. To ensure compatibility, the Watford DDFS features probably the most comprehensive and powerful 8271 emulation ever written for a double density system.

PRICES

- *Complete DDFS Kit incl. fitting instructions* **£46**
- *DDFS Manual* *(no VAT)* **£6.95**
- *We will exchange your existing Single Density DFS Kit for our DDFS Unit at* **£29**

NEW MEGABUFFER 256

This new Megabuffer 256 from Watford is a full featured 256K Printer Buffer. It allows the computer to print 256,000 character in a short time thus freeing the computer very quickly. In short it makes light work of printing large documents, screen dumps, etc. It is extremely simple to connect. The features are:

- Low Cost, High performance.
- Improves efficiency by making more efficient use of computer and printer.
- Compatible with any computer and printer that uses Centronics Parallel connections including all BBCs, IBM PCs, etc.
- Total compatibility with all software.
- Cheaper phone bills when using your Modems.
- Ideal for those doing large graphics screen dumps that are slow to print.
- Multi-Copy facility allows you to print several copies via Megabuffer without going through your computer.
- Data Dump facility is included.
- Built in test unit for both the buffer & your printer.

In conclusion it can safely be said that MEGABUFFER 256 is the ultimate printer Buffer for both the amateur and professional user.

Only £149 (carr £2)

BBC MICRO BUSINESS/ WORDPROCESSING PACKAGE

A complete word-processing package (which can be heavily modified to your requirements, maintaining the large discount). Please telephone or call in at our retail shop to discuss your particular requirement and a demonstration.

EXAMPLE PACKAGE

BBC Master 128K Micro, View wordprocessor, Viewsheet, Basic Editor, Terminal Emulator, Twin 800K 40-80 track double sided Disc Drives, Zenith Hi-Res green monitor, Panasonic KX-P3131 professional quality Daisy Wheel printer, Gemini Database, Spreadsheet, Beebplot Graphics, Cashbook, Final Accounts, Mailist, Easiledger, Invoice & Statements, and Stock Control packages on disc with manuals.

Only £899

A Low Cost wordprocessing package: Same as above except, a single disc drive instead of a twin and Olivetti Spark Jet Printer instead of Panasonic.

Only £625

MYSTERIES OF DISC DRIVES & DFS REVEALED (BOOK)

Are you tired of faulty cassettes, and lengthy loading times? Do you want to upgrade your BBC micro to take discs but you get tied up in the plethora of jargon surrounding the choice and use of these systems.

Then The Mysteries of Disc Drives and DFS Revealed is the book for you. It explains in detail the different types of systems available, how they are installed and how to use them. Many examples are given including pre-written programs to call various functions of the DFS available only through Operating System calls. Different types of disc, 40/80 tracks etc. are all explained. This book is ideal for the beginner confused by the plethora of choice available in the marketplace.

£5.95 (Book No VAT)

DISC ALBUMS

Attractively finished in antique brown leather look vinyl. Stores upto 20 Discs. Each disc can be seen through the clear view pocket. **£4**

FLOPPY HEAD CLEANER KIT

The heads in floppy drives are precision made and very sensitive to dirt. The use of a cleaner Kit is a sensible precaution against losing valuable data. It is recommended to clean the drive head once a week. It is very simple to use. **£8**

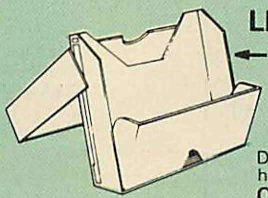
ANTISTATIC LOCKABLE DISC STORAGE UNITS

Gives double protection –
Strong plastic case that affords real protection to your discs. Antistatic helps avoid data corruption whilst in storage. The smoked top locks down. Dividers and adhesive title strips are supplied for efficient filing of discs.



- M35 - holds upto 50 discs **£8**
- M85 – holds upto 95 discs **£9**
- M50 – holds 50 3½" Discs **£10**

PLASTIC LIBRARY CASES



Holds up to 10 5¼" Discs. **Only £2.00**



DX-08: This extremely handy unit holds up to 8 5¼" Disc while in use. **Only £2.00**

DUST COVERS (For our Disc Drives)

Single CLS (without PSU) ***£3.20*** Twin CLD (without PSU) **£3.85**
Single CS (with PSU) **£3.95** Twin CD (with PSU) **£3.90**

Quality Disc Drives from Watford

To help you decide which drive is the most suitable for your needs (and your pocket!), we have produced the table below.

The first capacity given in the first column indicates capacity in single density mode. That within the brackets is the capacity in double density mode. All disc drive type numbers start with the prefix "C".

The tinting on some of the boxes is used to indicate which Drives are 40 track (non-tinted) and which are 80 track (tinted). All our drives are of Japanese manufacture. All our 80 track drives are already fitted with a 40-80 select switch.

***All our Disc Drives are Double Sided and will operate in both Single and Double Density modes.** Extensive experience of the usage of disc drives suggests that the JAPANESE drives currently represent about the best in terms of speed, reliability and overall "elegance" available for the BBC Micro.*

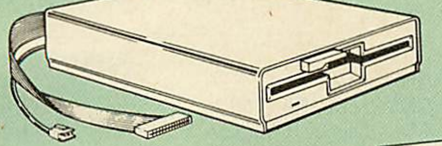
Various other "manufacturers" of disc drives for the BBC micro (more accurately, "packages" label other manufacturers drives with their own name). We buy the high quality JVC and Mitsubishi drives in large quantities directly from the manufacturers, package them and sell them at "dealer" prices direct to the public.

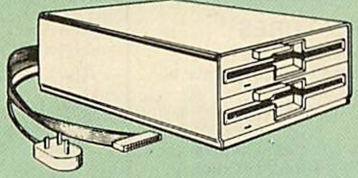
If you look around the popular BBC micro press, you will find that the prices we quote for the top quality, new slimline disc drives are, virtually without exception, some of the best around. These prices, coupled with the backup of one of the country's largest distributors of BBC peripherals provides a superb deal.

Unless you anticipate using dual drives in a fully expanded BBC system for long periods of time with little ventilation, then we suggest that our range of "CL" disc drives without the PSU (Power Supply Unit) would be quite adequate (extensive tests within our workshops have confirmed this). All drives are supplied complete with a SPECIAL UTILITIES Disc, Cables and Plugs. The Drives with power supply have a mains moulded plug for safety purposes. Ideal for Schools & Colleges. We are now able to supply all single disc drives with Power Supply, in either single or dual case. (Dual case has a twin data cable and a power supply capable of driving two disc drives) allows easy expansion to a dual drive unit, at a later date. Prices stated in the pricing boxes below for single drives is for a single drive in a standard single case. Single drive in a dual case cost an extra £5. (At Watford we anticipate your needs of tomorrow, not just today)!

When using a BBC Micro, most people find themselves short of desk space. The Watford's BBC Micro plinths form an ideal way of recovering some of this precious space) your BBC, Disc Drive and Monitor can all occupy the same vertical footprint and still be comfortably situated. With the Watford Double plinth, your Disc Drive is mounted vertically at one side, leaving a very valuable area directly in front of you for such useful items as spare discs, pen, paper, reference manuals, etc. Follow the trend with Watford plinth. (Turn to the 10th page of our advert for the Plinths).

P.S. All our 5¼" Disc Drives are compatible with the Compact Micro. All you require is the special Compact Disc Drive Cables designed by us.





Capacity	Drives without P.S.U.		Drives with P.S.U.	
	Single	Twin	Single	Twin
200K (360K)	CLS 200 £95		CS 200 £108	
400K (720K)	CLS400S £96	CLD 400 £180	CS 400S £109	CD400 £200
800K (1.44M)		CLD 800S £183		CD 800S £204

● TWIN Disc Drive Case, complete with Power Supply & Cables **£43**
Securicor carriage on Disc Drives £5 to £6

*Prefix **C** = Cased Drive*
***L** = Less PSU*
***S** = Single*
***D** = Double*

*Suffix **S** = 40-80 Switchable*

e.g. CLS400S = Cased drive, Less power supply unit, Single 400K, Switchable (40-80 track).

Cable to connect 5¼" Disc Drives to BBC Compact
Single £9 Twin £12
Special Cable to connect both 3½" and 5¼" Disc Drives simultaneously to the BBC Compact £13

3M – DISKETTES

3M – SCOTCH Diskettes with Lifetime warranty from Watford Electronics your 3M Appointed Distributor.

- *10 × 5¼" S/S D/D 40 Track Diskettes* ***£10***
- *10 × 5¼" D/S D/D 40 Track Diskettes* ***£12***
- *10 × 5¼" S/S D/D 80 Track Diskettes* ***£15***
- *10 × 5¼" D/S D/D 80 Track Diskettes* ***£15***
- *10 × 5¼" 1.6M D/S D/D High Density Discs for IBM XT* ***£30***
- *10 × 3½" S/S D/D 40/80 track Discs* ***£18***
- *10 × 3½" D/D D/D 40/80 track Discs* ***£22***

TOP QUALITY 3½" & 5¼" DISKETTES

To complement the range of quality discs and disc drives that WE already sell, WE are now supplying some special offer packs of 10 high quality discs. Each Disc has a reinforced hub ring and carries a lifetime guarantee. These are supplied complete with selfstick labels and packaged in an attractive plastic library disc box to protect them from damage. We strongly recommend these Discs.

DON'T SETTLE FOR LESS, BUY THE BEST

- *10 × **M3** 3½" D/S D/D 80 Track Discs* ***£20***
- *10 × **M4** 5¼" S/S D/D 40 Track Discs* ***£9***
- *10 × **M5** 5¼" D/S D/D 40 Track Discs* ***£11***
- *10 × **M7** 5¼" D/S D/D 80 Track Discs* ***£14***
- *3" Double Sided Discs* ***£3** each*

Special BULK OFFER on 5¼" DISCS

(Supplied packed in Anti-Static Lockable Storage Units)
(Lifetime warranty on Discs)

BULK PACK DISCS in lots of 100

Type	S-S 40T	D-S 40T	D-S 80T
● Without Sleeves	£46	£49	£72
● With Sleeves	£49	£52	£75

ACORN WINCHESTER DRIVES

Suitable for direct connection, via the 1MHz bus, to any BBC running ADFS. These Acorn Winchester disc drives are fast and extremely reliable. Each Winchester comes complete with the Level III Econet File Server software.

10 Megabytes **£1050; 30 Megabytes £1549**

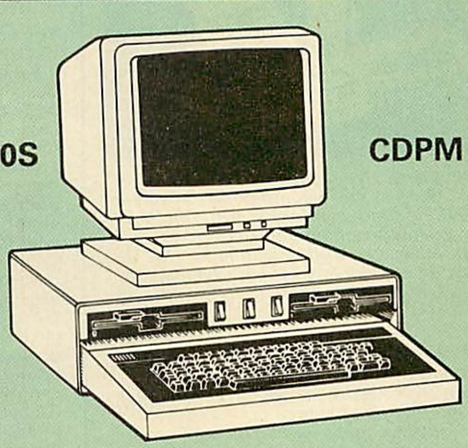
WATFORD's WINCHESTER DRIVES

- 20 Megabytes with ADFS **£635**
- 40 Megabytes with ADFS **£999**

WINCHESTER WORKSTATION

20 Megabyte Winchester, plus a Tape Streamer and a 400K Floppy Drive all housed in a plinth with cooling fan **£1499**

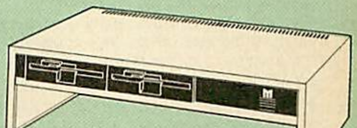
CDP 800S **CDPM 800S**



Twin 800K Double sided 40-80 track switchable disc drives mounted in an attractively finished Beige colour plinth for the BBC Micro. Supplied complete with integral power supply, cables and Utilities disc. The switches are mounted on the front panel for ease of use.

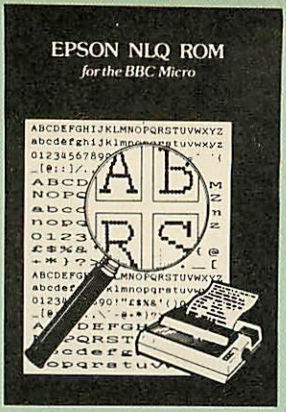
CDP 800S for BBC Micro £210 **CDPM 800S for Master £225**
(Securicor Carr. £7)

ACORN'S Twin 800K Disc Drives



Specially mounted side by side in a Master Plinth. Supplied complete with Cables. Plugs directly to the Master Computer.

RRP £250 **Our Price: Only £199** (carr £7)



Harness the full potential of your Epson RX or FX printer. The NLQ ROM makes Epson printers produce Near Letter Quality output with optional proportional spacing, enlarged and underlined. Accessed by simple * commands from Basic, Wordwise and View (with driver) or almost any other language.

(Send an SAE for sample printout)

Only: £25

VIEW PRINTER DRIVER for NLQ ROM £7

THE NLQ DESIGNER

(The First & still the Best)

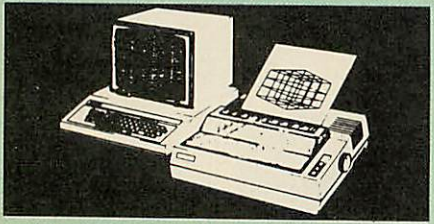
SPECIAL OFFER this Month: Supplied with over 25 Different fonts

A massively useful utility for users of the Taxan/Kaga KP810/910 or the Canon PW1080. This program allows you to define NLQ character sets to download into the printer's memory. Full on screen editing of the font. Requires 6264 RAM chip to be fitted in the printer.

Supplied with disc containing over 25 example fonts. Please specify 40 or 80 track. Fonts are: Italic, Courier, Courier Italic, Script, Copper Plate, Shadow, Bold, Double Print and Gothic etc. (P.S. This ROM is not suitable for Epson printers.)

- *NLQ Designer ROM & FONT Disc* ***£25***
- *Kaga Individual FONT ROMs* ***£10***

DUMPOUT 3



A highly sophisticated screen dump ROM. This has to be the most flexible and powerful screen dump ROM yet produced for the BBC micro. It will put on paper anything you see on the screen, including full Mode 7 graphics. Also provided are window setting utilities and OSWORD calls to plot and read Mode 7 graphics pixels.

Facilities:

- *Vertical and horizontal scaling in all graphics modes and mode 7*
- *Rotation of image by 90, 180 or 270 degrees*
- *Left hand margin setting*
- *Screen dump window setting*
- *Colours appear as grey scale*
- *Two tone fast dump*
- *Colour mask*
- *Mode 7 contrast expansion*
- *Mode 7 contiguous dump*
- *Key triggered and User Port triggered dumps*

The Micro User Feb. 1985. 'Without reservation I wholeheartedly recommend the Dump Out 3 ROM as the ultimate screen dump facility for the BBC Micro . . . it must represent excellent value for money and surely cannot be beaten".

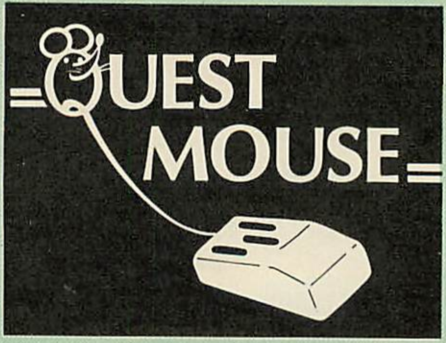
For use with the following printers:

GLP, GP80/100/250, CANNON, STAR, KAGA/TAXAN, NEC, SHINWA CP80, GEMINI, EPSON MX/RX/FX, M1009, NEC PC8023, DMP100/200/400, Panasonic KX1080, Mannesman Tally and compatibles.

Only: £25

(Write in for further details on all above ROMS)

NEW



QUEST MOUSE

The ultimate in Mouse technology, the Watford Electronics Quest Mouse. This package must be the most powerful Mouse package yet produced for the BBC Micro. Featuring state of the art 32K ROM software the Quest Mouse package is filled with features essential to the budding artist looking for the most powerful drawing program around.

The Quest Mouse is FULLY HARDWARE COMPATIBLE with the AMX MOUSE so that programs such as AMX Pagemaker etc. will work with it. The two parts of the Quest package are available separately so that existing Mouse owners can upgrade to the Watford Quest Paint software and so that worn out mice can be replaced for minimum cost.

The Mouse features high resolution 50 PPI operation. It has a rubber ball for maximum accuracy and has three buttons to allow a massive range of options to be accessed without touching the keyboard.

QUEST PAINT

The Quest Mouse software is supplied on a PALPROM unit to allow the sophisticated 32K program to be used from a single ROM socket. It is compatible with the BBC B, BBC B Plus and BBC Master Series machines.

The software is used to draw high resolution Mode 1 pictures in full colour. All menu selection and control of the drawing process is performed with the mouse so that you will hardly ever touch the keyboard. The software is carefully designed to provide all the features needed by the budding artist. It is the nearest we can get to using paintbrush, airbrush, pencil and rubber on your computer screen.

SOFTWARE FEATURES

The software is far too powerful for us to describe it fully in such a small space. Below is a list of the various features. For a full leaflet describing the software in full detail please write to us.

Disk interface not required. Utilities disk has facility to create and print big screens. Colours applied can be solid, dither pattern of user defined pattern. Drawing can use brush or airbrush. Brush shapes can be defined and stored. Airbrush sprays colour/pattern randomly with four jet sizes and even or centre spread. Colour cycles. Colour protection to stop particular colours from being overwritten by selected drawing actions. All standard drawing facilities: rubber, straight pencil lines, triangles, circles, ellipses, rectangles, parallelograms, polygons. All shapes can be solid or just a boundary line. Once a shape has been set up it can be repeated anywhere on the screen. Global colour replace in a rectangle. Powerful fill facility for areas and vertical/horizontal lines. Full cut and paste of rectangular areas with rotation and size change. Trace round areas of colour. Zoom for fine editing. Compatible with screens from Watford Beeb video digitiser. Load and Save screens with colour palette information, save brush and pattern definition etc.

SPECIAL INTRODUCTORY OFFER

QUEST MOUSE & QUEST PAINT........£59
QUEST MOUSE ONLY........£35
MOUSE MATS........£5
QUEST PAINT SOFTWARE........£34

(Quest Paint supplied complete with Software in a 32K ROM, User Guide and Utility Disc) (PS. The Watford Quest Mouse is FULLY Compatible with the AMX Mouse, therefore all AMX Software will work perfectly with it)

By popular demand our retail shop is now open until 8pm every Thursday

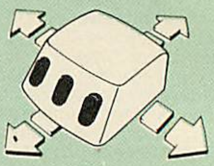
NEW

MARK II LIGHT PEN + PENPAL 2

The Watford Electronics Mark II Light Pen is the very latest in light pen technology. It is totally insensitive to local lighting conditions and works with many different monitors. The pen only responds to the High Frequency light produced by your monitor/TV. An LED indicates when valid video data is being produced. A conveniently located switch is also fitted. Penpal II, Watford Electronics' sophisticated light pen software is also supplied free on cassette or disc (please specify). This is a highly sophisticated drawing package enabling you to gain the maximum benefit from your Light Pen. The software is used to edit Mode 2 full colour screens using lines, patterns and you own designs. Screens may be saved to cassette or disc.

Price Only £15

THE AMX MOUSE



Now supplied with the NEW SUPERART Software ROM & Disc at no extra cost.

ONLY: £63 (carr £1.50)

(Please specify for BBC or Master Computer)

We are giving away, absolutely **FREE**, our popular Colour Art software package worth **£15** with every AMX Mouse package purchased from us.

AMX MAT	£5
AMX MOUSE ONLY	£35
AMX DESK Package	£19.00
AMX UTILITY Package	£11.00
AMX SUPERART Package	£39

AMX PAGE-MAKER Pack – A desk-top publishing software. It Works with keyboard, joystick and a mouse **Only: £32**

We are giving away, absolutely FREE, PAGE-FONTS, a disc containing over 20 fonts, with every purchase of AMX PAGE-MAKER from us.

PAGE-FONTS Over 20 fonts for use with AMX PAGE-MAKER	£9.50
EXTRA EXTRA	£19
AMX 3D ZICON Disc	£19
AMX Database Disc	£19
AMX XAM Educational	£19
AMX MAX(A gem of desktop (ROM)	£17

RB2 MARCONI TRACKER BALL

This popular unit is supplied complete with software.

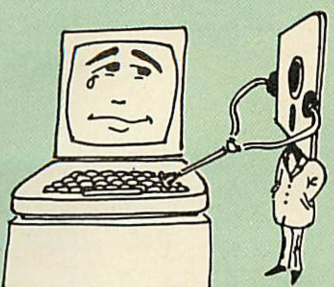
Price: **£59**

FLEET STREET EDITOR

Software pack **£35**

Admin Xtra Disc Utility	£14.95
Walt Disney Disc Utility	£14.95
Fonts N Graphics Disc Utility	£14.95

DIAGNOSTICS DISC



The BBC micro is a very complex machine and thus diagnosing a fault can be very difficult. Until now, the only way to discover the nature of a fault was either to find a competent friend with a large degree of patience or to find your nearest dealer and pay him to find out what is wrong.

At Watford Electronics, we realise how difficult it can be when faced with a problem, finding yourself a long way from your nearest dealer, or even just uncertain about your Beeb's health, but not wanting to waste time and money taking it to be looked at.

The solution to these problems is here now, in the form of the Watford's Diagnostics Disc. This excellent utility is specially designed to test out the following areas of your Beeb:
RAMs, ROMs, ULAs, Sound, Keyboard, Disc, RS423, ADC, User Port, Printer Port, Cassette, Joysticks, Speech, Disc Drives, 6502 and Z80 2nd Processors.

This utility is an invaluable aid for all those who take the reliability of their system seriously. A comprehensive manual provides full operating details and a list of possible causes and remedies for any faults that you may find along the way. The package also enables a permanent equipment and service record to be maintained.

Only £20.00

BBC SOFTWARE'S Popular Educational Software

- Maths with a Story 1 (Cassette). 4 primary level maths programs **£10.95**
- Maths with a Story 2 (Cassette) 4 further maths programs **£10.95**
- Picture Craft (Disc) 6 - 14 age group. Pack consists of flexible geometrical design & colouring programs **£19.95**
- WAVES: Science Topics (Disc) CSC O Level Physics program. **£14.95**
- RELATIONSHIP: Science (Disc) O Level Biology program. **£14.95**
- BONDING: Science (Disc) O Level Chemistry program. **£14.95**
- ELECTROMAGNETIC SPECTRUM (8 Discs) O Level program. **£14.95**
- ELECTRONICS IN ACTION (Disc) O Level program **£14.95**
- NEWTON & THE SPACE SHUTTLE (Disc) O Level program. **£20**
- ECOLOGY (Disc) O Level program. **£20**
- POLYMERS (Disc) O Level program. **£20**
- Clasification & Periodic Table O Level. The suite is supplied with its own database of chemical elements which can be classified according to your own rule. **£20**
- FOOD & POPULATION (Disc) O Level program. **£20**
- MICROTECHNOLOGY (Cassette) O Level program. **£6.95**
- A VOUS LA FRANCE (2 Cassettes) A French language home study aid. **£17**
- DEUTSCH DIREKT! (Disc & Audio Cassette) **£20**
- Modem Master (Disc) **£11.25**

TED

The Teletext Editor Package for serious users

TED is the brand new package from Watford Electronics for the editing and creation of teletext (Mode 7) screens and displays. TED is ideal for anyone wanting to create their own Mode 7 pictures (such as game title pages), designing animated displays for shop windows, exhibitions, classrooms, etc. TED is also probably the most powerful Prestel screen editor you will ever come across.

Supplied on a special 32k package, full facilities are providing for manipulating the screen, including easy to use pixel manipulation; line, column and block buffering and copying; left and right margins; large text in a variety of different fonts (contained within the ROM device); various borders and effects templates (contained within the ROM device); line and column insertion and deletion; easy to use graphics line drawing. Those are some of the features of editor itself. In addition to this, TED contains routines for taking a number of Teletext screens and creating them into an animated sequence, with user selectable display times, repeats on a group of shows, various entry methods (how the picture is put onto the screen), routing selection (both predefined and keyboard specific), chaining of other shows, etc. Scrolls treat the Teletext sequence as a very long page with a window onto it. Supplied complete with a comprehensive manual. There are many more facilities not mentioned here, so write in for a comprehensive leaflet; you'll wonder how you managed without TED.

Price: £35

ROM-SPELL

"way ahead of any competition"

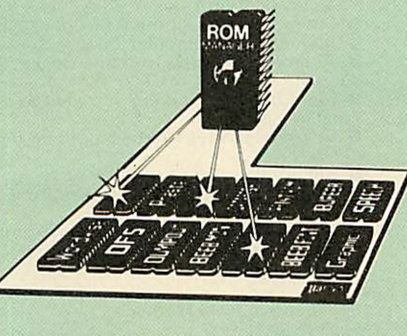


Probably the most advanced and fastest spelling checker available for the BBC Micro. Compatible with View, Wordwise and Wordwise Plus ROMSPELL is simple to use with easy editing of incorrect words. Full facilities for editing the user dictionary to allow customisation to your personal needs. Dictionary includes over 30,000 words and is supplied with a Comprehensive manual.

NOT compatible with 1770 DFS.
(Please state 40 or 80 track disc)

Price still only: £25

ROM MANAGER



Take control of your Sideways ROMs with ROM Manager. This powerful utility ROM gives you power over your sideways ROMs. Disable whole ROMs, send commands directly to named ROMs and many other powerful facilities.

"Provides comprehensive management of all your installed ROMs". (BEEBUG November '84.)

ONLY £20

NEW THE EUREKA CARD

(The Unique RAM Expansion System)

The Eureka Card is Watford's latest and most sophisticated RAM expansion system. Using advanced PAL based technology this card is a breakthrough in RAM systems for the BBC micro. The Eureka Card provides the user with around 58K of free memory in Basic, VIEW and WORDWISE PLUS. You also get Shadow RAM from within the active language. No other RAM expansion system can match that!

Load up to 58K long Basic programs. Texts in VIEW and WORDWISE PLUS up to 58K as well. This with absolutely NO loss of speed in accessing your text or program. Eureka consists of a card containing 64K of program memory, two parallel banks of sideways RAM and some extremely complex switching circuitry. This is all controlled by Eureka's highly sofisticated software supplied in ROM. Designed to a very high specification, this board is fully buffered to give reliable operation under virtually any circumstances.

The Eureka board plugs into the 6502 socket and has NO messy flying leads. It is compatible with many other products from Watford, such as our Solderless ROM Board and our ROM/RAM Board. All in all, the Eureka Card is an amazing board. Jump into the age of serious data processing with a Eureka Card! Please write in for further details 'on advantages the Eureka can offer you'.

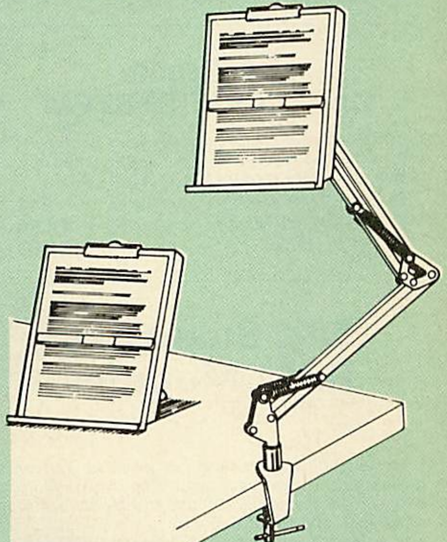
Introductory price: Only **£89** (carr £3)

(P.S. Eureka is only suitable for a standard model B; it normally replaces any Shadow RAM cards present. Some speed degredation does occur with filing system access. Eureka cannot be used at the same time as a second processor).

BEEBMON

The most powerful machine code monitor for the BBC Micro **£24**.

COPY HOLDERS



How often have you been about to type hand written notes into your computer when you find that there's nowhere to rest the paper or that your notes are resting at the wrong angle to read the type? Whether the notes be your latest program or the draft of a new trilogy, the new Manuscript Holders from Watford are superb for holding your paper at the ideal height and angle to allow you read and type in ease and comfort.

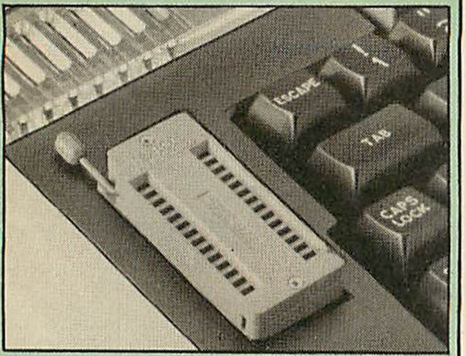
Available in 2 versions, desk resting and shelf clamping versions, these two units hold your paper firmly by means of a plastic retaining ruler and a clip grip.

Amazing value at only
Desk Top **£10** (carr. £2)
Angle poise **£14** (carr. £3)

All prices in this advert are exclusive of VAT.

Continued →

SIDEWAYS ZIF SOCKET



Allows you to change your ROMs quickly and efficiently, without opening the lid. The ZERO INSERTION FORCE (ZIF) socket is located into the ROM Cartridge's position.

- Very simple to install. NO SOLDERING required. The ZIF (Zero Insertion Force) eliminates the possibility of damage to your ROM pins when inserting & extracting.

- The low profile of the socket allows unrestricted access to the Keyboard.

- All data and address lines are correctly terminated to ensure correct operation of suitable ROMs with the BBC micro. We also supply a purpose designed see-through storage container with anti-static lining, allowing you to store up to 12 ROMs, protecting them from mechanical and static damage.

- This versatile hardware solves the problem of running out of socket space. Simply lift the ROM from the ZIF & insert a different one (No pulling or pushing of Cartridges. It is a must for all professionals and Hobbyists alike.)

- BBC, B+ and Master compatible.

ONLY **£15** (carr £2)

Low Profile CARTRIDGE SYSTEM

Complete System consists of: Low profile ROM Cartridge, Socket housing, Cable assembly, 5 labels and a library storage rack.

- Complete System **£11**
- Spare Cartridges **£2.50**
- Spare Rack **£1.50**

16K Sideways RAM Modules

Complete with such features as read and write protection, these new modules from Watford Electronics are ideal for the hobbyist, software developer and ROM collector.
Key points to note about this new addition to the Watford range of products are:

- Write protection (useful in a variety of circumstances).
- Read protection (allows recovery from ROM crashes).
- Compact construction.
- May be fitted in systems even with a ROM board.
- Multiple units may be fitted, even with a ROM board.
- No overheating or overloading problems.
- Free utilities disc supplied.
- Can be used as a 16K PRINTER BUFFER.
- Ideal for professional software development.
- Supplied with utilities software disc.

Only: **£29** (carr £2)

Optional extras

READ and WRITE protect Switches **£2** each
Battery for Battery Backup **£3**

16K DISC RAM

Unlike other RAM boards, this revolutionary, battery backed up, write protectable 16K sideways RAM board allows you to run from disc every sideways ROM available.

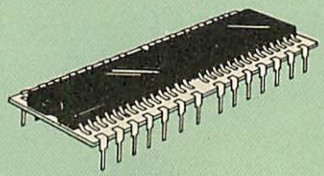
Features available are:

- No soldering or modifications to BBC micro necessary.
- Plugs into normal ROM socket fitting neatly under the keyboard allowing room for other add-ons.
- Easy to use. Comes with disk based software to SAVE and LOAD ROMs. Allows you to make backup copies of your ROMs.
- Disk software can be copied onto other discs when disc is full.
- No messy plugging and unplugging of your ROMs. Simply Load the one you want into DISC RAM.
- Ideal for Professional users to develop ROMs. Backup facility allows testing of final versions without using EPROMs.
- The switch provided allows backup and write protection to be switched off externally.
- Can also be used as 16K printer buffer RAM in conjunction with our Buffer & Backup ROM.

New Low Price: £32 (carr £2)

P.S. 16K DISC RAM Board is not designed to work in conjunction with a Sideways ROM Board.

SOLID STATE 16K SIDEWAYS RAM



This new unit from Watford, which utilises the latest in Static RAM technology, offers 16k of easy-fit sideways RAM in a very compact unit with a footprint no larger than a standard 28pin EPROM. With only a single flying lead terminating in a mini hook-on probe, to fit, (no soldering required) this compact unit works with any BBC Micro with or without a ROM board. ***Compatible with BBC B Plus.*** Like our other 16K RAM Modules, this unit is very simple to fit.

Only **£28** (carr 2)

Supplied complete with comprehensive software on Disc, Operating and fitting instructions.

Do you find the 16K Sideways RAM Units confusing? If so, we have compiled this quick questionnaire to help YOU decide which is the best one for you. If the answer to any of the questions is yes, then use the index number to select from the boards below. Options in brackets indicate possible secondary choices.

Do you require:

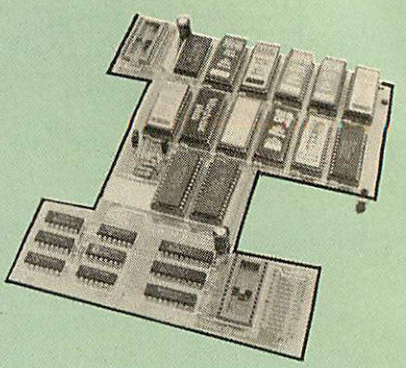
- Sideways RAM for a BBC B+ Choose 1, 2 or 3.
- Sideways RAM for the B+? Choose 3.
- A small, basic module? Choose 3.
- A sideways RAM module for a ROM board? Choose 1 or 3.
- More than one module installed at once? Choose 1 or 3.
- To use sideways RAM as a printer buffer? Choose 1 or 3.
- Battery Backup? Choose (1) or 2.
- Write protect for RAM (makes ROM look like RAM)? Choose (1) or 2.
- Read protect (allows recovery from crashes)? Choose 1.

Key:
1) 16k Sideways RAM Module
2) 16k Disc RAM
3) Solid State 16k Sideways RAM
4) Options in brackets indicate optional extras.

GRAPH PAD 2

Supplied complete with Software
£60 (Carr. £3)

SOLDERLESS SIDEWAYS ROM SOCKET BOARD



In the May 1986 Micro User's independent review, the writer concludes, "The board has been well laid out. Its position is much better than others – not over the HOT RAM chips and further away from the disc controller area". "I give the solderless ROM board the thumbs up and wish it success".

This brand new board from Watford Electronics is designed specifically for those wishing to add a ROM board to their own BBC without the need to perform any soldering.

This new board expands the total possible number of ROMs in a BBC from 4 to 16.

Unlike our competitors inferior boards, the ONLY upgrade required for fitting battery backup to the Watford Solderless ROM board (all Watford ROM boards, actually) is the fitting of the battery itself. (No other expensive components are required.)

- The key features of this new, no fuss, easy to install quality product from BBC leaders Watford Electronics are as follows:
- Increase your BBCs capacity for ROMs from 4 to 16.
- **No soldering required.**
- Very low power consumption.
- Minimal space required.
- Compatible with Torch, DDFS, RAM Card, 2nd Processor, etc.
- Socket 14 takes two 6264 RAM chips.
- Read protect to make RAM "Vanish") allows recovery from ROM crashes.
- Battery backup option for RAM chips.
- Supplied ready to fit with comprehensive instructions.

Price: Only £32
Battery backup fitted **£36**
(carriage £2)

NEW

The BBC B+ Micro ROM EXPANSION BOARD

Specially designed for all BBC Plus users, this board sits in an external box, and will accept either 10 off 16k EPROMs, OR 10 off 32k EPROMs.

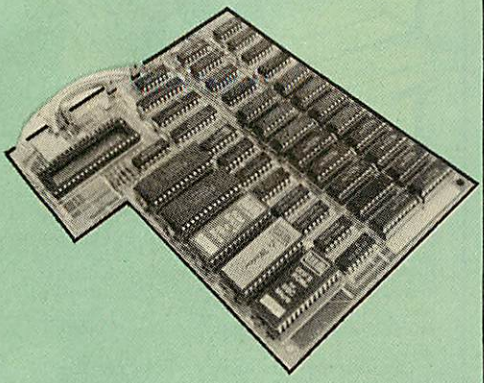
With the 32k EPROMs, only 5 can be 'online' at once (that's all the B+ can address, as each chip 'holds' two normal sockets worth), but you can swap between the two banks if *necessary. With* the 16k EPROMs, you can obviously address them all at once. An extra card can be added to permit 2 banks of 10 EPROMs to be used (again with only one bank available at once).

The ROM box, which has its own mains power supply, and connects to the BBC Plus via a specially designed card (which is a buffered card for your peace of mind) permits easy access to the EPROMs via the hinged lid. NO soldering is required for this board.

£79 (carr £2)

Watford ROM/RAM CARD

A must for all serious users



Watford Electronics announced the first ever commercial ROM board for the BBC micro, the Watford Electronics 13 ROM Socket Board 3 years ago. Following the success of this board, we have designed what probably represents the ultimate in expansion boards, the new Watford Electronics ROM/RAM board. This highly versatile and sophisticated board represents the latest in "2nd generation" sideways ROM technology for the BBC micro, designed to satisfy the serious BBC user.

- NO SOLDERING required to fit the board.
- NO overheating problems.
- No User Port corruption (avoids problems with the mouse, modems, Eprom Programmers, etc.)
- Fully buffered for peace of mind.
- Firm mounting in BBC micro.
- Compatible with all BBC micros (not BBC+ or Master).
- Total number of ROMs increased from 4 to 8.
- Up to 8 banks of sideways RAM (dynamic).
- Option for 16k of Battery backed CMOS RAM (CMOS RAM needs one ROM socket).
- Software Write protect for ALL RAM.
- Read protect for CMOS RAM (ALLEVIATES crashes during ROM development).
- Separate RAM write register (&FF30 to &FF3F).
- Automatic write to currently selected RAM socket for convenience.
- Accepts any ROM.
- FREE utilities disc packed with software.
- Compatible with our DDFS board, 32k RAM Card, Delta Card, sideways ZIF, etc.
- Large printer buffer.
- UNIQUE Fully implemented RAM FILING SYSTEM (similar to the popular Watford DFS).
- ROM to RAM load and save facilities.

The SFS (Silicon Filing System) can utilise up to the full 128k of RAM (with the SFS in any paged RAM) as a SILICON DISC. This behaves as a disc drive, with all the normal Watford DFS features (including OSWORD &7F for ROM-SPELL, etc.) to provide an environment that looks like a disc but loads and saves MUCH faster.

The ROM-RAM Board plugs into the 6502 CPU socket. This leaves free all the existing ROM sockets, which can still be used normally.

Any ROM that can be plugged into the BBC micro's own ROM sockets may be used in the ROM-RAM Board.

The ROM-RAM Board is supplied with all ordered options fitted as standard. Upgrade kits (with full instructions) are available for all of the options, for later.

Please write in for further details.

INTRODUCTORY PRICES:

- *ROM/RAM card with 32k dynamic RAM* **£39**
- ROM/RAM card with 64k dynamic RAM **£52**
- ROM/RAM card with a massive 128k dynamic RAM **£80**

(carriage on ROM-RAM Card £3)

OPTIONAL EXTRAS:

- *16k plug-in Static RAM kit* **£6**
- *16k Dynamic RAM for Upgrade* **£7.50**
- *Battery backup* **£3**
- *Read and Write protect switches* ...... **£2 each**

Complete ROM-RAM board (all options installed) **£89**

Le Modem



The MODEM from Watford

At last a professional MODEM for the BBC Micro. Unlike other 'Modem packages' this is a complete package there are no extra software costs to get 'up and running'. Of course Le MODEM is multi-standard, i.e. 300/300, 1200/75 & 75/1200 UK and BELL (USA) are all supported.

The features that make Le MODEM such good value are:

- *A complete communications terminal that transforms your BBC Micro into a very powerful World-wide data transfer system.*
- *Auto Dials, Auto answers, and is completely controlled by your micro. There are no external controls!*
- *Allows you to access PRESTEL, B.T. GOLD, THE SOURCE, MICROLINK, MICRONET, MICROWEB, THE TIMES NETWORK, MICRO LIVE (BBC TV database), CITY BB and more.*
- *Designed to be SIMPLE but SOPHISTICATED. To LOGON to a data base all you have to know is its TELEPHONE NUMBER, Le MODEM does the rest.*
- *Supplied with a comprehensive telecomms package in a 16K sideways ROM which includes a FULL PRESTEL terminal allowing TELE-SOFTWARE to be downloaded.*
- *A comprehensive 80 column terminal. This includes XMODEM error checked transfer protocol, to allow error free data transfer anywhere in the world!*
- *FULLY controlled by simple *COMMANDS allowing you to control it from your own BASIC programs. To get you started we supply a FREE disc of bundled software!*
- *Connects to the 1MHz bus. A *AUDIO ON-OFF command allows you to actually hear the telephone line through your BBC micro loudspeaker.*
- *Completely self contained with internal mains power supply. (Even a free mains plug is fitted!) A *TEST facility gives ON SCREEN indication that Le MODEM is working correctly.*
- *Packaged in such as way that you need nothing else except a BBC Micro to communicate with computers all over the world.*
- ***FREE Registration to MicroLink.***
- *BT Approval applied for.*

(When ordering, please specify the version required, (BBC or Master)

SPECIAL OFFER

Price: **£74**
(carr £3)

(Price includes, Le Modem, Software ROM, Cables & Comprehensive Manual)
(Write in for further details)

Nightingale Modem

SPECIAL PRICE to our Customers

£85

(Price includes: Nightingale Modem, Commstar ROM pack & Comprehensive manual)

Nightingale Modem without software	**Only £75**
COMMSTAR ROM package only (P&P on modem £2.00)	**£29**
Auto Dial Utilities Disc	**£9.50**

APOLLO

The NEW Modem from Watford

Following numerous requests from you, our discerning customers for an APPROVED, Low Cost & High Performance modem with Auto Dial & Auto Answer facilities as standard) we bring you the versatile APOLLO Modem. Just compare the features and look at the price (which incidentally includes the cost of the Software, manual and BBC connecting cable). We are sure you will agree that Watford Electronics in their traditional way are giving you a super 'value for money' deal.

Just look at these features:

- V21 for Bulletin boards, Microlink, Telecom Gold, etc.
- V23 for Prestel, Home Banking, and other Viewdata services.
- Reverse V23 allows User run Viewdata service.
- 1200-1200 half duplex for communications.
- XMODEM, HEX and ASCII file transmission.
- Auto Dial of given 'phone number.
- Auto Answer for User's Bulletin Board.
- 80 column terminal with split screen facility.
- Prestel text screen dump.
- Fully BABT approved.
- **FREE Registration to MicroLink.**

The Apollo is attractively finished in matt black. It opens the doors to world communication to both, the Hobbyist and the Professionals alike. With baud rates varying from 300/300 Originate and Answer, 1200/75 and 75/1200 full duplex and 1200/1200 half duplex, virtually all the popular tele-services can be accessed. A comprehensive Comms ROM oversees the use of the APOLLO, providing simple commands for all the software controlled facilities. APOLLO is an ideal modem for both the first time buyer and the seasoned user. Join the Telecommunications Revolution – Buy a Watford APOLLO!

Special Launch Price: **£75**
(Carr £3)
(Write in for full specification)

BT TELEPHONE CONNECTORS for Modems

LJU	1/4A Mini Line Master	£4.50
LJU	1/6A Mini Line Slave	£3.00
LJU	2/4A Line Master	£4.00
LJU	2/6A Line Slave	£2.50
LJU	3/4A Flush Master	£3.95
LJU	3/6A Flush Slave	£2.75
LJU	10/3A Dual Splitter	£5.50
	4 Way BT Plug	£0.75

Versatile **BEEB SPEECH SYNTHESISER** Unit



The Watford Speech Synthesiser is a very flexible speech synthesis unit based upon the powerful phonemes system. This system stores the building blocks of speech (called phonemes) and allows you to combine them quickly and easily to form virtually any word imaginable.

Supplied with an advanced ROM, you are provided with a 500 word dictionary to get you started. These can easily be added to by following the notes given in the comprehensive manual.

SPECIAL PRICE £32 (carr £2)

Continued →

COMPUTER CONCEPT'S ROMS

ACCELERATOR	£48
CARETAKER Basic Utility	£25
DISC DOCTOR	£28
Graphics ROM	£23
TERMI	£25
COMMUNICATOR	£49
SPEECH ROM	£24
Printmaster	£24

Wordwise £24

Wordwise plus

WORDWISE PLUS
£40

We are giving away absolutely **FREE,** the superb Word-Aid ROM worth £24, with every WORDWISE PLUS package bought from us.

Word-Aid

The most comprehensive utilities ROM for Wordwise-Plus

Extend the power of your Wordwise Plus word processor with this most advanced ROM from Watford. By utilising the powerful Wordwise Plus programming language, WordAid provides a whole host of extra features, all accessed via a special new menu option. This ROM has been personally approved by Mr Charles Moir, the author of WORDWISE PLUS.

- Alphabetical sorting of names and addresses.
- Text transfer options.
- Chapter marker.
- Epson printer codes function key option.
- Search and display in preview mode.
- Embedded command removal.
- Print Multiple copies of a document.
- Multiple file options for print and preview.
- Address finder.
- Label printer.
- Mail-merger.
- Number/delete/renumber.
- Clear text-segment area.
- BBC B, B+ and Master compatible.

Only **£24**

(N.B. Word Aid requires a Disc Interface in your Micro)

HI-WORDWISE-PLUS DISC: £5

SPELL MASTER £49

Inter SHEET ONLY £37

INTER-CHART ONLY: £26

Inter-WORD

Only: £42

Special Discount price for the existing Wordwise Plus owners. Simply quote your reg. number and pay.

Only: **£39**

All Prices Exclusive of VAT

VIEW

VIEW WORDPROCESSOR 2.1 **£37**

VIEW 3.0 ROM

Price: Only **£54**

HI-VIEW £36
(for use with 6502 2nd Processor)

VIEW Printer Driver Generator £9
Please specify Disc or Cassette)

VIEWSHEET (Acornsoft) £37

VIEWSTORE £37

VIEWSPELL with 80 track disc £29

VIEWPLOT Disc £22
(Please specify for Master 128 or Compact)

VIEW-INDEX £12

OVERVIEW Packs 1 & 2 for the Master £85

Watford's own Sophisticated VIEW PRINTER DRIVERS

Epson FX80 & Kaga KP (Disc)	£10
Juki & Brother HR15 (Disc)	£10
Silver Reed Printers (Disc)	£10

Micros in Business (Disc)
An introduction to Business software for the BBC Micro from Acorn **£43**

ADVANCE COMPUTER PRODUCTS' ROMs

Adv. Disc Toolkit	£29
Adv 1770 DFS for Mast/Compact	£29
Adv 1770 DFS for BBC/BBC+	£29
Adv Disc Investigator	£24

MINI OFFICE II (disc) £14.50

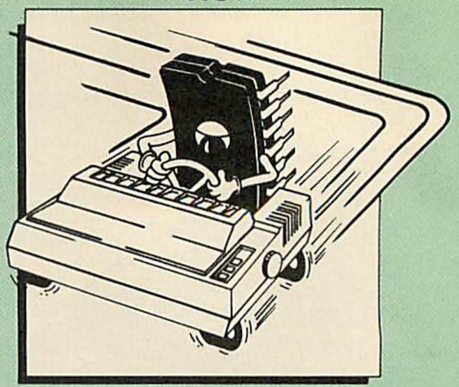
REPLICA 3

This new improved REPLICA 3 from Clares is a very powerful disc based TAPE to DISC Utility. It now transfers even more programs than ever before. Replica 3 will not work with all programs but then neither will anything else. 30,000 Replicas have been sold to date. It has to be good.

£13 (40 or 80 track)

Acorn's Speech Synthesiser package, complete
Special Offer £18

VIEW PRINTER DRIVER ROM



View is a powerful word processor, but until now has seriously lacked in terms of printer support. With the launch of our Printer Driver ROM, which includes an extremely powerful and easy to use Printer Driver Generator, View users can find themselves in the realms of advanced word processing only at a small outlay.

The VPD extends View's printer command with a series of mnemonic commands. All standard highlight sequences are also supported. A large range of printers are supported by drivers contained within the ROM (the drivers can be downloaded and customised). Printers supported include: Epson's MX, RX, FX, FX, LX, JX80 range, HI80, KP810/910, PW1080, JP101, HR15, M1009, GLP, JUKI 6100, etc.

Other printers are readily supported by defining a Printer Driver using the built in Printer Driver Generator. The features mentioned below are available to both the built in Printer Drivers and user defined drivers (assuming the printer supports the features).

NLQ control, Underline, Bold, Proportional Spacing, Microspacing, Italic, Superscript, Subscript, Condensed, Enlarged, Double Strike, Set lines per inch numerically (e.g. LPI 6), Set characters per inch numerically (e.g. CPI 5), Select printer font, Select printer ribbon colour, Translation sequences, Emulation of BBC Character Set, Simple numeric expressions for certain operations, Full printer setup, Send control codes, Print prompt on screen, Redefinable Pad character, Pause for key press, Prompt to change daisywheel, and Execute * command when printing.

Other features include a very powerful on screen preview, with bold, italic, underline, super/subscript, enlarged highlights, and a special printer driver to allow memory based text to be previewed by View 1.4. Of course, View 1.4, 2.1 and 3.0 are all supported, as is Shadow RAM and 6502 Second Processors. The BBC B series and Master series of micros are supported. A comprehensive manual is supplied. All in all, a very professional product for the discerning user who wants power at their finger tips. (Write in for a detailed leaflet).

Price: Only £33

THE INVESTIGATOR

This sophisticated Utility program on disc, enables you to make security back-up copies of most of your valuable Disc Software. Makes full use of all 8271 (will not run with double density DFSs) facilities to discover the precise format of your protected disc so that an exact copy can be produced. Supplied with detailed instructions. Please specify 40 or 80 track disc when ordering. Only **£20**

ROMAS

THE CROSS ASSEMBLER AND MACRO EDITOR FOR SERIOUS PROGRAMMERS!

ROMAS is a carefully designed, sophisticated yet simple to use, development system for serious assembly language programmers. Using the BBC as the development system, you can choose your target system from the following processors:

6502, 65C02, Z80, 8085, 8041, 6809 and Z8
P.S. This includes the Acorn 6502 & Z80.

A give away at . . . **Only £29**
Please specify 40 or 80 track disc when ordering.

ARIES CORNER

Aries B-32 Shadow RAM Card

18 months of intensive research and development have produced a worthy successor to the widely acclaimed Aries-B20: the revolutionary Aries-B32. This 'second generation' expansion board features 32k of RAM and a 16k ROM socket.

Like the BBC B+, the B32 provides 20k of shadow screen RAM and 12k of sideways RAM. Unlike the B+, the B32 has simple software commands which allow the user to reconfigure the RAM as 16k of shadow RAM and 16k of sideways RAM, or all 32k as sideways RAM.

With the B32, the programmer gets up to 28k of RAM available for Basic, Logo, Comal, Forth, Lisp and BCPL programs in any screen mode. The business user gets extra memory for View, ViewSheet, Wordwise Plus and many other applications. For advanced applications, the scientific user gets access to a massive 47k of data storage using the Acorn approved *FX call.

Sideways RAM enables you to load sideways ROM images from disc, allowing you to have a large library of sideways ROMs (subject to the copyright holder's permission) stored on disc. The B32's sideways RAM can also be used to extend any operating system buffer (such as the printer buffer) or to load tape programs into a disc system.

The B32 simply plugs into the processor socket on your BBC micro – no flying leads to connect and no soldering. Provision of the on-board ROM socket means that the Aries-B32 control ROM does not use up one of your existing ROM sockets.

Price: B-32 **£80** (carr. £2)

Aries B-12 Sideways ROM Board

This board is extremely well made, simple to install, reliable when fully loaded and compatible with the Aries B-20 and the Aries B-32. For the business user or educationalist, the compact and secure internal fitting is ideal, with the ROM board tucked neatly inside the lid where it will not cause overheating problems. The serious software developer and the hobbyist may prefer to mount the board externally, giving instant access to the sockets for experimental purposes. A zero-insertion force (ZIF) socket may be fitted to the board to enhance this mode of operation.

The B12 provides a total of twelve sideways ROM sockets (the four in the original machine are replaced by the twelve on the board), all fully accessible by the MOS sideways ROM system. In addition, there are two sockets for sideways RAM, giving up to 16k of RAM using 6264 static RAM chips.

The B12 system consists of two parts: a large detachable 'mother board' which carries the extension ROM sockets and a small 'base board' on a short ribbon cable, which plugs into the existing sideways ROM sockets. This two-board design eliminates the reliability problems previously associated with some other ribbon-cable based systems.

If you do not have an B32 or B20, a small adaptor module (the Aries B-12C) is available at a nominal cost. The 6264 static RAM chips used to provide the sideways RAM are advertised elsewhere in our advert.

Price:
Aries B-12 **£40.** Aries B-12C **£5**

THE ARIES RANGE HARDWARE REQUIREMENTS

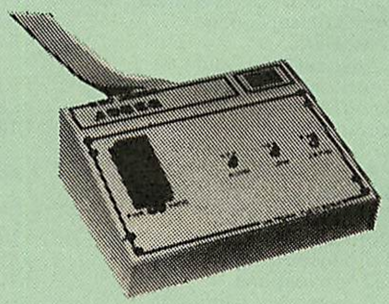
Aries B-32 & BBC B, MOS 1.20, hardware plugs into CPU socket.
Aries B-12 & BBC B, MOS 1.20, hardware plugs into all four sideways ROM sockets and connects to the B32 or the B20. The adaptor Aries B-12C module is necessary where these are not fitted.
Aries B-488 BBC B, MOS 1.20, Hardware plugs into 1MHz Bus.

ARIES B-488 IEEE-488 INTERFACE UNIT

The Aries-B488 is an interface unit to enable the BBC micro to control and monitor IEEE-488 bus systems. The IEEE-488 bus (also known as the 'GPIB' or 'HP-IB') is the standard method of interconnecting programmable laboratory instruments and control equipment. Using the B488, up to 15 devices may be connected in a single high-speed data network.

Aries B-488 Unit: **£238** (Carr £3)

ADDER



Adder is the ultimate EPROM programmer for the BBC Micro. It will program many different EPROMs up to the very latest 27256 32K devices.
The Adder unit connects to the User Port and draws its power from there too. The EPROM is mounted in a top quality ZIF socket. There are no switches or controls as Adder is entirely software controlled.
The Adder software provides sophisticated facilities for programming EPROMs from a RAM image produced by loading disc files. The software is menu driven and designed for ease of use.
Features:

- Two ultra fast programming algorithms or standard slow algorithm.
- Supports standard 21V programming and newer 12.5 volt EPROMs. (Software switched).
- The RAM image to be programmed can be built up in many ways. Sections of image can be loaded separately. Part programming. Read EPROM. Edit data in memory.
- Automatic processing to handle a list of files to program into the EPROM.
- Automatic disc buffering to allow programming of 32K 27256 devices from a 32K file without extra effort.
- Verification gives detailed error list and checksums are maintained. There is also a blank check facility.
- Works with all standard filing systems. Generates header code for RFS ROMs to allow Basic programs etc. to be stored in EPROM. More than one file per ROM permitted.
- Programs the following EPROMs: From 2K to 32K: 2516, 2716, 2532, 2732, 2764, 2764A, 27128, 27128A, 27256 (Both 12.5V and 21V).

£65

TEX EPROM ERASERS

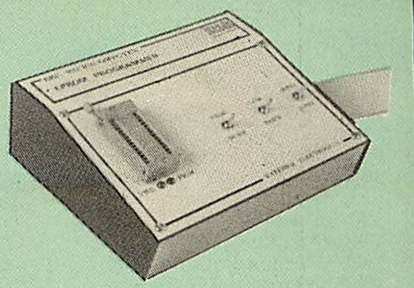
EPROMs need careful treatment if they are to survive their expected lifetime. Over erasure of EPROMs very rapidly turns them into ROMs! The TEX erasers operate following the manufacturers specifications to give the maximum possible working life by not erasing too fast. We use these erasers for all our own erasing work.

- **ERASER EB** – Standard version erases up to 16 chips. **£28** (carr £2)
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EPROM PROGRAMMER



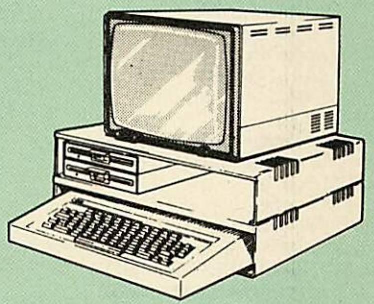
The Watford Electronics' EPROM programmer for the BBC micro is a high quality self contained package. Programs all popular EPROMs from 2K to 16K: 2716, 2516, 2532, 2564, 2764 and 27128. All manufacturers' specifications have been followed to program EPROMs at the correct speed – wrong timings could destroy your EPROMs. The unit has its own power supply so does not put heavy loads on the BBC power supply as do some other units. Connects directly to the 1MHz bus following all Acorn recommendations on addressing and bus loadings.

SOFTWARE PACKAGE
The software is supplied on an EPROM which plugs into the Micro and is instantly available with a single command (no time wasting as on Cassette-disc loading). It is a fully purpose designed and ingegrated package to simplify ROM development. The system is menu driven with many prompts to avoid any accidents.

Software facilities include:
Load File – Save File – Down Load EPROM – Program EPROM – Verify – Blank Check – Editing of memory contents prior to programming.
Also included is an automatic system to allow Basic programs to be put in EPROM and accessed through the *ROM filing system. More than one program may be put in an EPROM. All these facilities and more are explained in the comprehensive and clear 15 page manual.

SPECIAL OFFER £69 (£3 carr.)

PLINTHS FOR BBC MICRO, MASTER & PRINTERS



Protect your computer from the weight and heat of your monitor. The BBC micro plinths have slots for maximum ventilation. The single plinth is suitable for a BBC and monitor, whilst the double height version provides enough room for our stacked or side-by-side dual disc drives or TORCH Disc pack, to be placed in the centre section. If you use our stacked drives, the remaining space can be used for further peripherals e.g. Speech Synthesizer, EPROM programmer or simply stationery. The computer slides neatly in to the lower section allowing easy access to remove the lid. The printer plinth is equally sturdy but without the cooling slots. It allows for access to the paper from the front as well as from the rear, (a facility not often thought of in similar products) if the paper is located beneath the plinth. This is a very convenient way to work especially if your work area is not deep enough to take the printer and paper separately.

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Continued →

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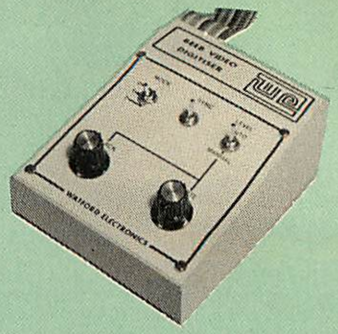
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Using any source of composite video (colour or monochrome) and the Watford Beeb Video Digitiser, you can convert an image from your camera into a graphics screen on the BBC Micro.

This uses the full graphics capacity of the BBC micro in modes 0, 1 or 2. The video source may be a camera, video recorder or television, and is connected via the video output socket.

Images produced can be compressed, stored to disc, printed on an Epson compatible printer, directly used to generate graphics, analysed for scientific and educational use or converted to other formats e.g. Slow Scan TV or receiving a picture from a remote camera using a modem.

The output from the digitiser exactly matches the graphics capability in each mode, with up to 8 levels of grey in mode 2. The unit connects into the User Port and automatically scans a complete picture in 1.6 seconds.

Both the black and white levels can be adjusted manually for the optimum picture, or switched to automatic for unattended use. The image produced can be reversed if necessary.

Full controlling software is supplied on a normal sideways ROM and this is easily accessed via additional * commands. The package is designed to allow easy input of complex screens and give full access of the data to the user. Once on the screen, the image can be used as a normal graphics screen, allowing any of the usual graphics commands in BASIC or other ROM's to work on it.

A special print dump routine is included with the driver programs. This is specially designed to produce a fast, correctly proportioned picture, with reduced "contouring", resulting in an accurate reproduction of the original image.

Detailed examples of driving this unit from BASIC or other languages are all provided in the extensive manual supplied.

£109 (Carr. £3)

(Price includes) Digitiser Unit, Software in ROM & a Comprehensive Manual)
(BBC B+ and Master compatible, except Master with Econet)

Magazine Maker

(As seen on TV)

A combination of the AMX Pagemaker and Watford's Beeb Video Digitiser.

Using any video that provides a composite signal and the digitiser, images from a camera or TV can be converted into a graphics screen on the BBC Micro.

They can then be used within AMX Pagemaker to illustrate magazines or newsletters – in fact anything that needs to be created on A4 size paper.

With Pagemaker's many features, a variety of pictures can be composed – the only limit being the imagination.

Pictures can be doctored using Pagemaker's graphics option to produce any number of effects.

Text can be formatted around the digitised photo on screen using the facilities available, which include 16 typefaces, character and pattern definer, text formatting and the ability to load in wordwise and viewfiles plus much more.

Once created the picture can be printed out.

The Magazine Maker is suitable for any use that requires illustrated documents.

Complete Package **£129.00** (carr. £3)

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Price: **£2**

ACORN MUSIC 500

BBC B, B+ & Master compatible.

You too can acquire this music package that has already thrilled thousands, for:

ONLY **£49** *(carr £3)*

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This attache carrying case is attractively finished in mottled antique brown leatherette. An ideal and safe way of carrying your BBC Micro around. Supplied with two Keys.

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With these DIP switches soldered to their keyboard, any BBC B or B+ owner can take full advantage of the fast disc drives that we supply by configuring his BBC for fast disc drive operation.

Excellent value for money at **£1.00**

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Supply from BBC power supply to standard Disc Drive connector.

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DISC DRIVE INTERFACE LEADS

BBC to Disc Drives Ribbon Cable

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Badger Micros (Devon), Badger's Hill, Southerton, Ottery-St. Mary, Devon EX11 1SE. Tel: 0395 68516.

Beebug Retail, Dolphin Place, Holywell Hill, St. Albans.

Cambridge Computer Store, 4 Emmanuel St., Cambridge CB1 1NE. Tel: 0223 358264.

Cirkit Distribution Ltd, Park Lane, Broxbourne, Herts.

C.J.E. Micros, 78 Brighton Road, Worthing, West Sussex. Tel: 0903 213361.

Farnell Electronics, Canal Road, LEEDS LS12 2TU. Tel. 0532 636311.

HCCS, 575-583 Durham Road, Low Fell, Gateshead, Nr. Newcastle Upon Tyne. Tel. 091 4870760.

Mancomp Ltd, Printworks Lane, Levenshulme, Manchester. Tel: 061-224 1888-9888.

Microman Computers, Rainford Industrial Estate, Mill Lane, Rainford, St. Helens

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OVERSEAS DEALERS

*Absolute Electronics, Rewal House, 208-210 La Trobe Street, Melbourne, 3000, Victoria, Australia. Tel: (03) 663 2411.

Alpha Computer Co, Shop 314 Chi Fu Commercial Centre, Chi Fu Fa Yuen, Hong Kong, Tel: 5-506592.

Computer Distribution Company, Parklaan, 47, B09300 Aalst, Belgium.

E.B.N., Elisenstrasse 13, 1000 Berlin 41. Tel: (030) 7952057

Lendac Data Systems, Unit 31, IDA Enterprise Centre, Pearce Street, Dublin 12. Tel: 710796.

Scientex P.V.B.S., Zilversmidstraat 2, B-2000 Antwerpen, Belgium, Tel: 03 233 59 06

Techno-matic Data, Holbergsgade 19, 1057 Kobenhavn K, Denmark

*Velobyte, Scheaedyksadyk 5a-6a, 3011 EB Rotterdam, Holland, Tel: (010) 413 8197/414 5171.

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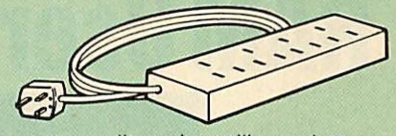
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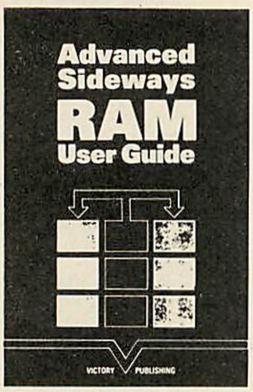
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ORDER VIA microLink 72:MAG030

RAM GUIDE

AU OFFER

Bruce Smith's RAM User Guide



Sideways RAM is a technique central to the new Acorn Master series of computers. It allows you to load in software from disc or cassette which is designed to behave as if it were part of the machine, and is always on tap to the user.

Ex-*Acorn User* Technical Editor Bruce Smith's book, *Advanced Sideways RAM User Guide* for the Master and BBC computers will allow you to exploit sideways RAM to the full. The book is backed up with tried and tested software for you to use straight away or adapt to your needs (and for those with less nimble fingers it's available on disc).

Features of the book include: 25 programs and routines demonstrating the use of sideways RAM; compatibility tables and conversion notes for the BBC micro and Electron; writing languages and interpreters; extensive indexing; and there's even a ROM formatter developed by Bruce Smith for use on commercial software, ready for you to type in and use.

Please send me_____ copy/copies of the Advanced Sideways RAM User Guide by Bruce Smith at £9.95 (including postage)

Please send me_____ copy/copies of the book and the Master software* disc at the special price of £14.95 (normal price £17.90)

Please send me_____ copy/copies of the book and the BBC micro software* at the special price of £14.95 (normal price £17.90)

*Discs can be read on 40 and 80 track drives

I enclose my sterling cheque/postal order for £_____ payable to Victory Publishing (European readers please add £2 per item for p+p, £5 for airmail)

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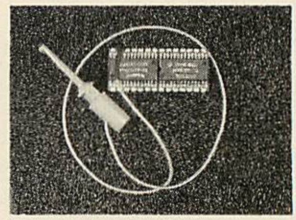
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USERRAM

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Sideways RAM for £30



- New low price – only £30
- Easy to fit
- 16k sideways RAM chip with attached connecting lead
- Disc of utility software
- Comprehensive instruction booklet
- Fully compatible with the BBC B and B+ micros
- Simple for schools
- Ideal for Econet

Take a piece of software, load it in *UserRAM* using the utilities provided and it can be accessed instantly using a star command or run as a Basic program. The *Acorn User UserRAM* is as easy to install as a sideways ROM, with just one lead to clip on to the leg of a chip – there's no need to unplug the chip.

A comprehensive printed manual gives fitting instructions, information on how to create your own sideways RAM software and technical notes on how the utilities provided work. Also, a standard disc (which runs on 40 and 80 track drives with any DFS and is unprotected) is supplied with all the basic utilities needed. One year's guarantee is given, with postage and VAT included.

☐ Please send me _______ copy/copies of the sideways RAM pack at £30.00 each

I enclose a cheque/postal order made payable to Hybrid Memory Products Ltd for £ ________________

Please debit my Access card A/c No Expiry date

NAME ________________

ADDRESS ________________

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SIGNED __________ DATE __________

Send this coupon with your remittance to UserRAM, Acorn User, Redwood Publishing Ltd, 141-143 Drury Lane, London WC2B 5TF. HA23

SET 'EM UP JOE

If you've been impressed with the friendly front-ends on 16-bit micros, try this version for ADFS

Joe Telford

Go on Joe, me ole mate, have another! Wow! Invited to the Redwood Carvery and offered food plus Canadian lager. There had to be a catch. The Ed reappeared with a steaming plate and casually placed a large mug of ale beside the plate. 'Eat-up young feller,' he said. 'Never let it be said that we don't look after you.'

Later. . . 'Well Joe, now you're well fed up, there is something that you could do in return! You see, Joe, olefrenole mate, there's a lot of Master 128 users out there, and we've had a lot of mail about the article you done on the Wizard of OS. It needs a follerup! Wot we need is like a Napplemac front-end ter drive the ADFS.' I gulped. 'Or possibly you could rewrite Gem. Yes, that would do fine, for next week please.' They stood. 'See y'round Joe, bye now. . .' As I watched him stagger off, there was a cough behind me: 'That'll be £27 please. . .'

Before progressing further, readers who might like to put this article into perspective should read three particular back issues which give details of subsets of the software developed here: The Wizard of OS (June 1986), On the Menu (Sept 1986) and A Cool Calculator (Nov 1986).

As usual when I agree to an idea, I only find the problems afterwards. In this case, I spent a couple of days playing with an Apple Macintosh, and borrowed a Master 512 running Gem to get some ideas as to what might be feasible. Aficionados of each system will have to forgive me for the findings and criticism.

First consider floppy disc systems; both Gem and the Mac desktop were gruellingly slow. The Mac desktop seemed easier to use and understood its system better than Gem. But this I put down to the difference between the Apple system being a dedicated operating system and Gem being a portable front-end.

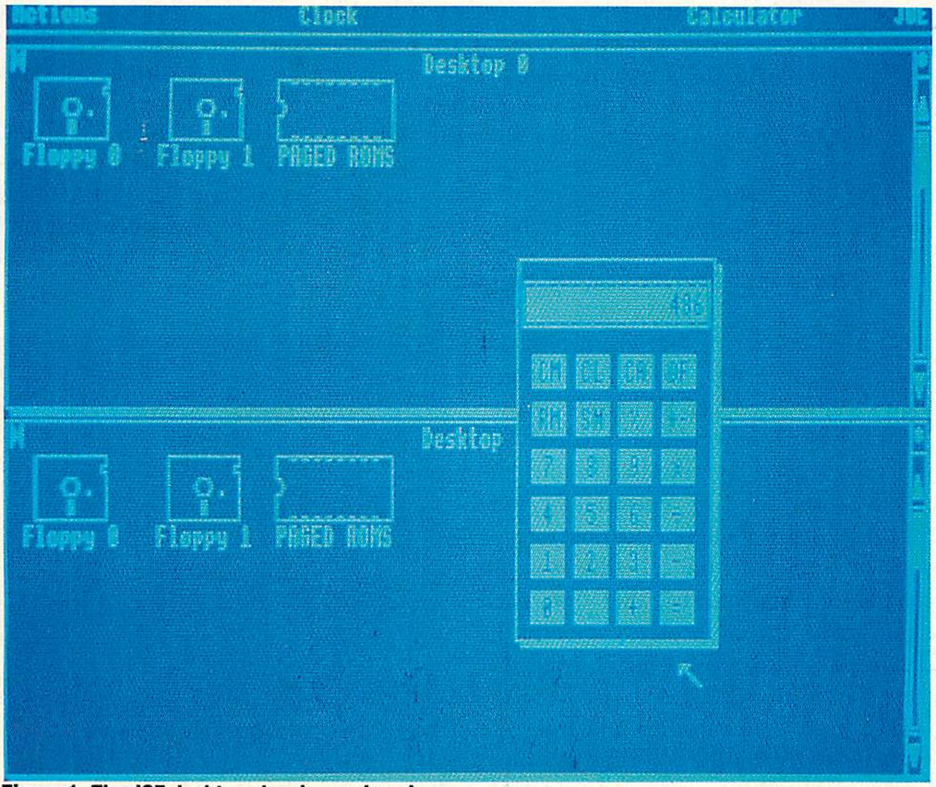


Figure 1. The JOE desktop showing various icons

Next, I moved up to a Winchester drive on each machine, and the Mac system took off, leaving Gem far behind. However, Gem has one benefit over the Mac – it can live on a Master 512. This means BBC Master users are more likely to encounter it than the Mac. It seemed logical that I should try to investigate the possibility of providing Acorn users with a Gem-like environment which would allow them to explore the benefit of the WIMP approach to handling their machine. The first thing to do was to explore Gem and what it could do. The second was to identify what concepts were portable onto the BBC micro without the 512 board, and then to implement them.

Gem itself is not, you might be surprised to find, a program. Rather it is a collection of programs stored in an ADFS-like directory on a special DOS (disc operating system) formatted disc or section of a Winchester disc. This relieved me intensely, until I realised the size of the programs under consideration. One reached 55k, and such a program size was bound to cause problems even for the Master 128.

The next stage was to consider what micro the system would work with. Because of the heavy use of high resolution graphics I envisaged, mode 0 would be

Point 1: Access
a) Be bootable from a star command
b) Be bootable on Shift-Break
c) Be bootable between discs

Point 2: Desktop Facilities
a) Display a Gem-like desktop
b) Be driven by simple cursor/command keys
c) Support two filing systems windows
d) Support other (expandable) desktop tools:
  i) Clock
  ii) Calculator
  iii) Copyright window

Point 3: Window Facilities
a) Windows at three levels:
  i) Level −1 (into the Sideways ROMs)
  ii) Level 0 (the desktop)
  iii) Level 1 to n (the ADFS pathname$)
b) Scrolling windows above level zero
c) Go to last level facility by pointing at a 'Close' icon
d) Full-screen window facility by using an 'Explode' icon

Point 4: Actions inside windows
a) Display all files and folders in a directory
b) Create a new folder (ie, a new directory *CDIR)
c) Open and enter a folder (ie, *DIR)
d) Delete a folder:
  i) Empty folders
  ii) Any file
  iii) Unplug selected ROMs
e) Move files, with optional rename:
  i) Within a window
  ii) Between windows
f) Copy files, with optional rename:
  i) Within a window (with rename)
  ii) Between windows (ie, between dirs/discs)
  iii) ROM image to sideways RAM
  iv) Sideways ROM/RAM to disc image
g) Enter Applications: (expandable by user)
  i) Auto exec of EXECUTE files (eg, !BOOT)
  ii) Auto CHAIN of Basic programs
  iii) *RUN of machine code programs
  iv) Auto *WORD with selected document loaded
  v) Auto *SHEET with selected document loaded
  vi) Insert selected ROM or if inserted. . .
  vii) Enter selected language ROM

Point 5: Other Actions
a) Change background/foreground colour
b) Sound on/off
c) *BYE for Net/Winchester
f) Check free space on current disc
g) *COMPACT current disc
h) Exit to Basic in last directory indicated

Table 1. The tasks that the JOE front-end can undertake

needed. I estimated the main program would be quite large, so a system which used shadow screen RAM, like the Master 128 or BBC B+ would be needed. The program should specifically handle the ADFS with standard operating system calls, but I felt it should be possible to cope with an Econet. In the end, this was not completely implemented, but interested Econet users should be able to modify the desktop to handle NFS. Finally, I felt that there was much to be gained by adding the facility to save and load to and from the sideways ROM and RAM. Thus the specification of the target machine should read:

- Page at 0E00 (or use a cruncher to shrink the program)
- Shadow memory screen mode 128
- Four sideways RAMs plus RAM access via *SRLOAD
- Advanced disc filing system
- Any combination of Winchester and/or floppy disc drives which will support the advanced disc filing system

This front-end was called the Jottings Operating Environment, or JOE for short. Here we concentrate on the specification of JOE. It should be able to do the tasks outlined in table 1.

Having decided what JOE should do, we can discover its limitations. There are three main limitations with version one JOE:
1) No manipulation of whole discs
2) No manipulation of 'folders' – delete/copy full folders
3) No possibility of working in the second processor unless sideways ROM access is not required

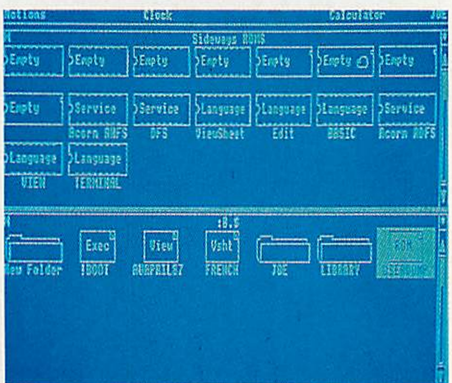


Figure 2. JOE catalogues are displayed

The simple way around points one and two is to select the ADFS utility directory and to chain the appropriate Acorn-provided application. When this is complete, return to the desktop with a *JOE command. A later version of JOE may get round item three.

The language of WIMPs

Readers will no doubt be aware that the term WIMPs means 'windows, icons, menus and pointers'. The idea is that windows are opened to give information, and are closed after use. Icons are the symbols inside the windows which we can visually translate to an action. Look at figure 1, which contains a picture of the JOE desktop on the Telford Towers Master 128. Notice the icons available for two floppy discs, and paged ROMs. Notice also the 'butterfly icon' in the top left of each window. This closes the window and moves one level back toward the zero level desktop. In the opposite corner is the 'explode' icon '*', which alternately expands the window to full size and back to half size.

Below this are the 'scroll-up' and 'scroll-down' triangles, which scroll ADFS windows up and down to access icons. Between the two scroll icons is the scroll bar. The black area indicates how much of the available space is showing. Remember that scrolling can only occur in levels greater than zero and in half-size windows. Clicking on a floppy disc icon displays a catalogue. This is shown in figure 2. The icons in such a window are either folders, symbolic of directories, or files, which can be of almost any type. The file type is specified inside the file icon, and *version one* JOE supports types:

BAS,CODE,ROM,DATA

The language of the mouse

Mice are standard devices to control Gem and the Mac, and cause a pointer to move

on the screen. Not every user has a mouse, so JOE also uses the keys in table 2.

The AMX Mouse can replicate the keys in table 2 (except CTRL) and hence readers with such a mouse should be able to press it into service. Digimice were also used successfully by readers to modify my calculator program of last year.

The WIMP language related to JOE is quite easy to understand, and consists of simple words and expressions as in table 3. We will use this language to explain how to use JOE.

Using JOE

Before using JOE make sure it is set up as shown in the section 'Setting up JOE', and that you have a back-up copy of all the major programs, because in learning to use the JOE you could just possibly destroy your hard work. Until you are used to a visual front-end, you might just click on and delete an application without wanting to, despite the safety locks built in!

If the system is set up correctly, on pressing Shift-Break you will be met with the desktop very much like figure 1, except that you might have only one floppy disc, or you might have one or more hard discs as well as the floppies. The pointer begins by pointing to the most used disc which is always set as the first disc icon on the desktop. Make sure you have a disc in all the drives mentioned, or JOE might hang up when you access an empty drive, then try the following simple tasks to get used to the system.

Double-click on the most-used disc icon and you should see the contents of its root ($) directory. The top of your window will keep track of the path-name to the current directory. Double-click on another disc in the lower window. If you've only one disc then double-click on that in the bottom window. Now find a directory in each window. Double-click on that so you have two different directories open.

Exploding windows

Click on the explode icon in the top window. That window should expand to fill the screen. Click again and the window should return to half size. Try expanding and contracting the lower window.

Click anywhere on the word 'Clock' and the date and time will be continually displayed, stopping only when you click again or activate another icon. Click on 'JOE' and a window will pop up explaining JOE. You can only leave this by clicking the 'OK' button.

Key press:	Function
Cursor up	Pointer moves up
Cursor down	Pointer moves down
Cursor left	Pointer moves left
Cursor right	Pointer moves right
SHIFT + above	Pointer moves as above four times faster
CTRL during pointer movement	Calls *UserDump* to dump current screen (delete if not required)
Return	Activate desk icon
followed by:	
Return	Enter Application/ insert ROM
Copy	Enter Copy/Move mode – Copy made on next Return
Delete	Try to delete selected icon
Escape	Return to desktop level

WIMP word	Meaning
Folder	Directory
Click	Press Return
Click on PROG1	Use the cursor keys to move to icon PROG1 then press Return
Double-click	Press Return twice
Drag	Press Copy then use the cursor keys to move the pointer.
Delete	Press the Delete key
Close	Click on the butterfly icon. (Returns down the directory path)
Explode	Click on the explode icon. (Gives you full/ half screen windows)
Open COMAL	Double click on the folder called COMAL. (Moves you into that dir or activates an application program or ROM)

Top: table 2. Keys used by JOE Bottom: table 3. The JOE WIMP language

The actions window

The 'Actions' window is activated by clicking on the word 'Actions'. The arrow pointer becomes a highlight bar which moves up and down as the cursor keys are pressed. To leave this window the highlight bar must be clicked on 'Close this Window'. Try clicking on 'Foreground' and 'Background'. Watch and listen to the effect of clicking on 'Sound'. *BYE allows you to lock-up your hard disc or exit from the network and 'Exit Joe' returns you to Basic, in the last folder visited. So to use this exit command to leave JOE from directory :0.$.BASIC.GAMES, first open windows until the top line of the window reads :0.$.BASIC.GAMES then move into the window and click. Now move to Actions and click again. Click the highlight bar on Exit JOE and you will leave JOE but be left in the selected directory.

There are two extension commands to the Actions window. These are 'Check disc space' and 'Compact current disc'. To select any of these first click on a file icon in the window of the required disc. Then drag to Actions and click again. Notice that the pointer changes to a hand icon, to represent 'carrying information'. The menu will now have two extra commands which can be clicked on. The window caused by 'Check disc space' vanishes when the Actions window is closed. The cost of compacting the disc is that afterwards the JOE program has to return to the desktop, as compacting a disc uses the RAM normally given over to JOE variables. The complete Actions window is shown in figure 3.

The new folder tool: Every directory has a new folder tool. It allows us to create folders. Double-click on the icon and follow the instructions on the resulting pop-up window.

Deleting: It is only possible to delete from within a disc window. You cannot delete from the desktop or within the ROM window. It is however possible to unplug ROMs by first clicking on them then pressing Delete. In a similar way it is possible to click onto a program or folder and press Delete. This will delete a program or an empty folder, but not a folder which contains material.

Copying: It is not possible to copy folders. To explore the copy facilities, open two different folders with files in each and click on one file. Drag to the other window and click anywhere. Follow the instructions in the pop-up windows.

Transferring ROM images

Open a folder containing ROM images, and open the paged ROMs icon. Click on a ROM image in the 'Open folder' and drag to a sideways RAM slot then click. This may be empty, but it doesn't matter! Follow the instructions and the ROM image will transfer; see figure 2.

Many people will want to transfer images from ROM to disc. This can be achieved by clicking on a ROM slot and

dragging to an open folder in the other window then clicking. Any ROM in memory will go across in this way, though readers will note that some firms protect their ROMs to stop them being used as images. Neither I nor *Acorn User* would condone the use of this program to make illegal copies of ROM software. The facility is provided to allow the ROM owner to gain the most effective means of access to his or her ROM software.

Calculator

The calculator is based on the calculator program in November 1986 *Acorn User*, modified to work in mode 128 and exit back to the JOE desktop. The calculator is shown in figure 1.

Accessing applications packages

The JOE can tell whether a file which has been clicked on is a standard data file or a Basic program, a ROM image or possible machine code, and consequently can access the software in the most appropriate manner. This is all very fine for Basic programs which are simply CHAINed, and machine code routines which are *RUN, but data files tend to be ignored because they could be produced from almost any source. A program that allows JOE to recognise other file types appears with a brief explanation on the yellow pages.

Once your processing has been done, the simplest way to reactivate JOE is by typing *JOE which calls another utility from the library and reinvokes JOE. If it fails to work then Shift-Break or CTRL-Break followed by Shift-Break will do the trick.

Setting up JOE

The JOE environment has to be found in three places on your system:

1) The main $ directory of disc :0
2) The library (any disc providing it is always available)
3) The JOE source directory (any disc providing its always available)

The first thing to do is to create a JOE folder and a library folder, if you haven't always had one. In a two disc system place these on disc one and leave it permanently in the disc drive. Then you simply change disc zero as your applications change. The $ directory of each disc zero will need one file as explained below. If you have only one disc drive then everything goes on that and you must set up every disc as described here. If you have access to a Winchester disc then set up the Winchester disc with everything and that's that!

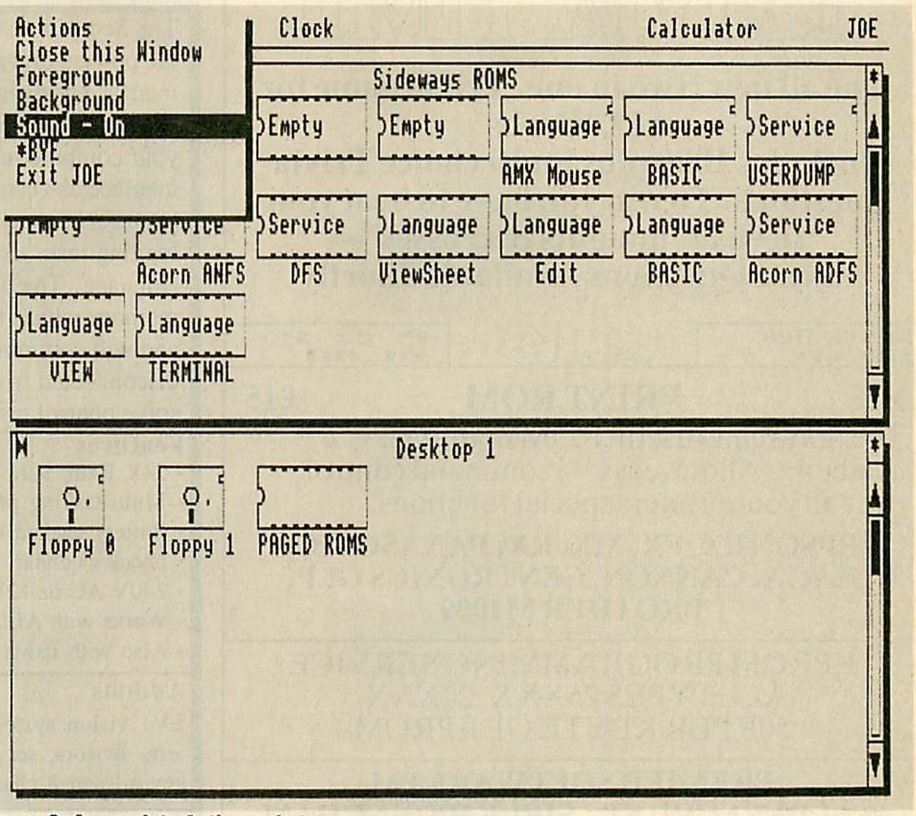


Figure 3. A complete Actions window

The :0.$ directory

This needs a !BOOT file which reads:

0001 *LIB :0.$.LIBRARY
0002 *JOE

then press Escape and set up *OPT4, 3. Next decide on the source directory for JOE and create it. We suggest:

*CDIR :0.$.JOE

but users with twin disc systems may want to try:

*CDIR :1.$.JOE

Next transfer the programs shown below from the yellow pages to this directory. This is one of those times when the *Acorn User* monthly listings disc will prove worth its weight in gold. It will save you about a week of typing plus all the checking. Once the programs are in place and tested the command *ACCESS * WRL will save a lot of heartache, by protecting them from accidental overwriting.

Programs which need to go into the JOE directory are:

JOEVDU
JOETOP
CALC
STARMAKER
ICONMAKER
FILEMAKER

JOETOP, JOEVDU and CALC can all be left for the time being, as they are the driving programs for JOE. Move back to the JOE source directory and load STARMAKER. Return to the library directory and then list the program. Line 80 may need changing to match your source directory for JOE. Do this by editing as normal and alter that portion beginning *DIR ... up to the ¦M. This is the string which will call JOE into being. Once done, run the amended STARMAKER program and *JOE will be saved into the library directory on the disc.

You can return now to the JOE source directory and chain first ICONMAKER which sets up a file of icons in the source directory, then chain FILEMAKER, which will ask a number of questions, and from these questions build a 'defaults' file for the system. This defaults file contains the desktop colour scheme, the number of discs, and their disc numbers, as well as the pathname for the JOE source directory. Once you have completed the question session the defaults are saved as a defaults file. If you ever wish to change the defaults, simply return to the JOE source directory and run the FILEMAKER program again.

Now JOE is ready to go. Press CTRL-Break then Shift-Break and the desktop should appear. Read the previous section on using JOE again as you explore. With a little practice you'll find that the Jottings Operating Environment is a regular 'gem' of an idea!

Turn to the yellow pages index on page 113 for details of the JOE programs.

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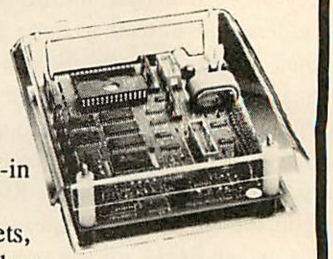
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EDITING YOUR OWN

***Acorn User*'s supremo gives some tips to would-be press barons**

Tony Quinn

Publishing involves a lot of people with many different skills. No two publications are the same and the variations between the branches – books, magazines, newspapers – are vast. Even before you start breaking these areas down, try comparing a quarterly scientific journal with *Woman's Own*. However, certain roles can be identified in them all.

Let's start with the writers. These include reporters who tell readers what has happened as accurately as possible, and feature writers or columnists. Here, the writing is usually longer, not so strong on news, but opinion is important.

Writers are told what to do by the editor. Once the copy is in, it goes to the editor who checks it is what was expected and gives it to the sub-editors (subs). They correct mistakes and factual errors, check spelling, ensure the stories fit the 'house style' (for example, whether you say swap or swop, disk or disc), and mark up the copy for the typesetter. This whole process is called subbing.

Once this has been done, the copy goes to the typesetter to return as 'galleys' (long strips of text). These are corrected and used by the art editors to produce page designs or layouts. They leave space for pictures and headlines and glue down the galleys on pre-designed page grids which contain standard information such as the size of the page, and where any logos or headings go (shown as an overlay on this page).

These designs go back to the subs who write the headlines, picture captions and so on. Photographs are marked up for enlargement or reduction. This lot is then returned to the typesetter who glues down the real strips of text, which are on photographic paper called 'bromides'. Any photographs are also turned into bromides. Photocopies of the resulting pages come back as a 'page proofs'. The proofs are corrected (usually several times) and eventually 'passed for press'. This means the typesetter can photograph the whole page as a piece of transparent film which is sent to the printers. There it is printed, gathered together with all the other pages and bound with a cover.

The process described above is the same for company reports, product manuals, school magazines which are typeset and national magazines (although computerised layout and subbing is coming in fast). So if you plan to do your own publishing, you're going to have to play the role of all those different people. And there's a lot more than just the mechanics of production to go through.

The magazine

I'm going to call everything here a magazine, but the points apply equally to newsletters and books, and I'll be giving examples of each.

The editor must first decide who the readers are or will be. That's the real skill of an editor: it's not to write the copy, lay it out or whatever, but to make sure that the magazine is read and bought by as many people as possible and that it is what they want or need to read.

List the potential readers. On *Acorn User* we have different types of equipment: BBC micros, Electrons, Masters, Compacts, discs, printers and so on. There are different types of reader: games players, schoolchildren, teachers, business people and industrial users are some examples. There are different uses: wordprocessing, programming, graphics, and so on. Make a list for your magazine and put them in order of importance. Next, decide how you can appeal to readers and what their priorities are. Now I'll quote my first example.

About 18 months ago, Bruce Smith started writing a book on sideways RAM. His publishers weren't interested, so we decided to publish it. We had the subject matter, and it was aimed at experienced programmers. The priority was to get it out quickly because the Master was about to be launched. We decided to print it out ourselves on a daisywheel printer from *View* files, and ended up with 2000 copies in time for the *Acorn User* Exhibition last summer. A page is shown in figure 1 and it's hardly beautiful to look at. But for Bruce's book the priority was speed, and as a reference book it would be dipped into, rather than read in one large chunk.

When you feel you know your readers, make up a page grid-sheet and decide on your production method. First, is page size. *Acorn User* is A4, but if you plan to do your own photocopying and you want a bulky-looking product, turn the A4 page on its side, fold it in half and you have A5. Get hold of some magazines which are produced in the same way as your own and study them. What don't you like? Are there any ideas you might like to copy? Look at the contents pages so you don't forget vital things like your address.

Even if the magazine isn't sold, the cover is important. Don't waste it on just a title and contents list unless there's a good reason. The same with the back. The centre spread is another big selling point. What can you do with that? A poster, your best illustration, a special layout, a pull-out calendar – all are chances not to be missed.

If you go for A5 and don't use typesetting, then use no more than two columns. If you try more, big gaps will open up

between words. With A4, the limit's three. If you have trouble, try substituting smaller words or breaking long ones up with a hyphen. If you have a lot of hyphenated words, consider wider columns, a smaller type-size or unjustified text.

So you've got a cover, contents page, news, features, events calendar, letters. It's a good idea to label what section you're in with some kind of logo across the top. You'll see this on all papers, books and magazines. When you've decided on the contents and the grid, do a 'flat plan' for an issue. This shows what will go on each page in the way of editorial and advertising. Figure 2 shows part of the flat plan for this month's *Acorn User*. You should be able to pick out this very page.

In the process of firming up a flat plan you will have to make decisions about how long articles are, and should also make a list of features for following issues. The next stage is to make up a realistic schedule. It should include a commissioning date to remind you, dates for subbing, galleys, layouts, proofs, pass for press, printing, binding and distribution. Don't forget to allow time for posting things around the country (and plan for what happens when some of it gets lost). Often the publishing date will be fixed, so work back from there. Add in a few days just in case. By the time you've finished you'll probably find you're already a week late! Circulate this plan to your accomplices involved in the production process. With the flat plan send a set of notes explaining the whole thing in more detail. (Don't let the contributors see it though. They'll immediately want to know why so-and-so needs so much time and why they have so little).

Next you'll need a style guide pointing out character widths for columns, if you're going to prepare galleys from word-processors, or type-sizes if the publication is to be typeset. It will also need notes for house style (you'll find these develop as you sub the copy); remember it's consistency you're aiming for.

Now you'll notice we haven't done anything yet. We've just prepared the way. Many amateur (and not so amateur) magazines never get half these things sorted out – they just happen. But if you adopt this professional approach, you'll impress everyone and show you mean buisiness.

Editing

At first your writers might think it's great having their name in print, but what happens when their copy isn't right according to the set of rules you've established? You may well have to rewrite someone's copy, and although most authors will agree (but make sure you tell them as you do it and say why), some will get the hump. That's when you have to be able to justify your decisions and demonstrate an editorial policy. You should however never change writer's opinions: convince them and get them to make the changes. Only rewrite for length, or where something is badly written.

Pot Pourri 91

```
PHA              \ pull stack to balance previous push
LDA #Ø           \ call serviced
RTS              \ return
.notfound
PHA              \ put service code in accumulator
RTS              \ and return
```

As usual, this code assumes that on entry the service call type was preserved on the stack. If an IRQ is not identified by any of the ROMs then the MOS directs a final call through the user vector IRQ2.

Service Call 6

This service call is used to inform paged ROMs that a BRK has occurred, before the MOS hands control over to the current language ROM via the BRK vector (BRKV), to process the BRK. In many instances the BRK is used to signal an error, and print an error message. If the service call does not intend to process the BRK, for example to produce some extra fancy error messages and pointers, the contents of all registers should be preserved. The vectored address at &FD and &FE points to the error number in memory while the byte at &FØ contains the value of the hardware stack pointer after the BRK was executed. As the BRK may have occurred in a ROM other than the one currently processing the BRK, it is important to be able to ascertain in which ROM it did occur. To do this OSBYTE &BA should be called, and the ROM number is returned in the X register. As always if your ROM traps this call it should load the accumulator with Ø before returning to the MOS, otherwise the service call number should be preserved so that the MOS can poll other ROMs.

Service Call 11

The major filing and networking systems on the BBC micros make extensive use of non-maskable interrupts (NMIs). This call should be used when the ROM system currently using it (ie a DFS ROM) no longer needs to do so and is prepared to release it. When this service call is issued the Y register holds the number of the ROM that was using the NMIs before the claim for them was made. Each ROM that recognises this call should check the contents of the Y register with its own ROM number, available in the X register and location &F4 at the time of the service. If it is the same then the accumulator should hold zero on return from the service call, otherwise all registers should be preserved. The

Figure 1. Daisywheel-set *Sideways RAM Guide*

Reporting and writing

Brief your writers well so they know what to do. Otherwise it's your fault if copy doesn't come up to scratch. Send them a deadline, and ask to see an outline before the copy is due in if you're worried. The outline does two things: it says what they plan to write so you can change the emphasis if needed, and get them going before the real deadline. Check on the author before the deadline: that's the date it should be on your desk, not when they start writing the article.

The points above apply equally to your own copy. Names, addresses, phone numbers especially – you'll rue the day you get one wrong. The golden rule is, never let anyone sub their own copy.

The instructions you give your writers as to layout will obviously vary according to your production process, but it's a good idea to ask them all to set up a standard 'start' file for all their text. This will make your job easier. Also make them aware of your style; again it'll save you time and effort and be good discipline for the writers. Copy should always be presented on paper, even if you're dealing with it off disc and

ACORN USER FLAT PLAN JUNE VERSION 1 18.03.87

Section_4(features -- Shona) Pages_81-112 Printing_____4/1

81	82	83	84	85	86	87	88
JT Desktop 4-COL	JT Desktop 4-COL	JT Desktop	AD	JT Desktop	AD	TQ Editor 4-COL	TQ Editor 4-COL
89	**90**	**91**	**92**	**93**	**94**	**95**	**96**
TQ Editor 4-COL	AD 4-COL	TQ Editor	Reader Offer	TQ Editor	AD 1/2 Subs	Joseph Book 4-COL	AD 4-COL
97	**98**	**99**	**100**	**101**	**102**	**103**	**104**
Joseph 4-COL	AD 4-COL	Joseph	AD	Joseph	Wllimson	Wllimson 4-COL	AD 4-COL
105	**106**	**107**	**108**	**109**	**110**	**111**	**112**
Wllimson 4-COL	AD 4-COL	Wllimson	Megarry WP	Megarry WP	AD	Comp 4-COL	AD 4-COL

20ed/10.5ad/1.5house

Figure 2. Part of the flat plan for this *AU* showing page numbers, whether colour and so on



General comments

One of the dangers of doing anything on a computer is that you end up spending more time using the computer than you do on the actual job. The results you get after four hours' work with an art package might be excellent, but couldn't you have done just as with a photocopier and bits cut out of magazines?

The illustrations above show a method of getting pictures into a graphics package using grids. Draw a grid on the original and a gird on the screen. Use this as a guide for freehand or rubber-band drawing. This can then be tidied up and coloured. The singer Sade was done by Jonathan Inglis using AMX *Super Art*. The grid was removed using one of the utilities on *Acorn User's Graphics Utilities* disc. Finally, the picture is coloured. But beware the pixel-editors! You can spend hours touching up the tinest details. Another method of pulling in graphics is to trace a picture onto transparent film (or even a clear plastic bag) and stick this on your monitor screen as a guide.

When you print out your camera copy, use a new ribbon to get a good black result. Fill this in using a pen if it's not black enough. Again, a bromide of the whole page will improve the quality of the photocopied or printed result.

Colour prints do not generally reproduce very well in black and white. Try it out on a photocopier first. Blues do not reproduce well and reds come out black.

The fonts in most page make-up packages look very spindly when blown up large. However you can easily thicken them up with the pixel editor and save the results for later use.

Black marks on your camera copy can be blanked out with 'Liquid Paper'. If any cut marks show where you've pasted things together, it will hide these as well.

the final reading should also be from paper. Don't rely on spelling checkers for disc copy: they can't spot the most common pitfalls such as 'its' when you mean 'it's', repeated words and words spelt correctly but used in the wrong context, eg, 'there car' instead of 'their car'.

Copy should have double-line spacing, with large margins at the sides, top and bottom to make notes and corrections. It should have a header giving details of the date written, the author, and a 'catchline' (one word describing what the copy is about). Pages should be on separate sheets and the author's name, address and phone number should be included. A covering letter should list all contents, so you can check what the author has sent in and identify anything which gets detached in the production process.

Remember that reporting is about facts, not opinion (unless you're quoting other people's). All reporters have the five Ws drilled into them: who, what, why, where and when.

The important facts should be in the first two paragraphs, so you can cut from the bottom if space is tight.

Subbing

You'll probably end up writing your style guide up as you go along, so keep a sheet of paper handy to note additions and alterations. Don't forget your dictionary, and develop the ability to spot words which might be wrong, even if you don't actually know how they are spelt. Always look at all the elements of an article – pictures, captions, diagrams and text. They all need editing. Subs are the great trouble-shooters on a paper: they spot errors, bad writing or grammar, libel and other legal problems, and are the first to shout when something is missing or doesn't make sense. Remember the following golden rule: if it doesn't make sense, sort it out; if you can't sort it out, get rid of it.

If you are working on disc, it's better to dump the copy onto paper and edit it with pencil. Then make the changes to the disc file. When you're positive you've got it right, dump it again and check again for mistakes you may have missed.

If you're sending copy off to be typed up or to be typeset, remember to log it all in and out. Keep a copy of everything: if you can't, at least make sure you know what you've lost and give thought to what you'd do if the worst happened.

Proofreading

Remember to read everything on paper. Proofreading is about checking galleys and pages for mistakes in spelling, typography and to see if anything has been missed out. Use a ruler as a guide so your eye is not tempted to jump a line. A classic mistake for proofreaders is to spot one mistake and miss another on the same line. But remember you're proofreading, not subbing here.

Page layout

Figure 1 shows a layout for the A5-sized *Sideways RAM Guide* mentioned earlier. The way this was done was that the pages were dumped from a wordprocessor on a daisywheel on A4 paper. These are then sent to the printers who reduce the pages down to 83 per cent of the full size for printing. There are several good reasons for doing this. First, the daisywheel typesize would be too big for an A5 page. Second, when reduced all artwork gains in the density of the black, and so prints better. If doing it again, I'd probably remove the

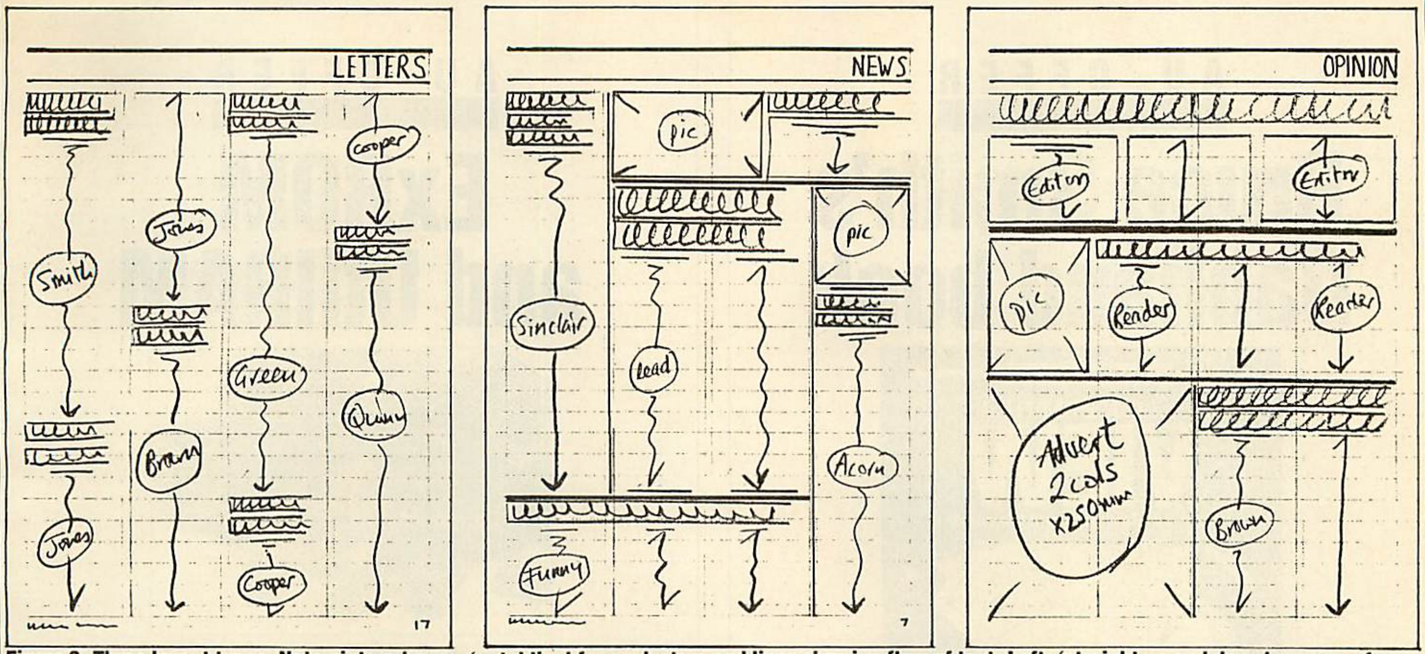


Figure 3. Three layout types. Note picture boxes, 'catchline' for each story and lines showing flow of text. Left, 'straight up and down' common for letters. Middle, 'modular'. Right, 'horizontal'. Used where the length of stories are similar each issue: opinion, reviews, etc.

justification on the right-hand edge, as the rivers of white were quite a problem.

There is nothing special about this method. It is simple, you can do it at home and it's inexpensive. Holes can be left in the pages for any illustration. The method is equally applicable to dot-matrix output, and you can see where the page breaks are going to be on your wordprocessor. Do it chapter by chapter, and when you dump it out you can see if any headings fall too near the bottom of a page or if tables and so on break across pages and make suitable changes in the file.

Magazines on A4 sheets can be done in the same way. The difference will be in the use of headlines, number of columns and style, so let's look at some ideas. Most of these ideas apply to A4, A5 and to page make-up packages.

Before you lay out any pages, the grid should be established. Print out plenty of paper versions so you can plan things easily. Figure 3 shows some page layouts' each reflecting a different design philosophy. The first is the simple 'straight up and down' as used by *Acorn User*'s Letters pages. You simply fit in the copy from the top of the left column, and each new story follows on with a different headline.

The next is a 'modular' page design, as used in *Acorn User*'s News pages. This technique is used a lot on newspapers such as, *The Guardian, London Daily News* and *Liverpool Daily Post* to name just a few. There are regular interlinked blocks of text, and the 'legs' or columns of copy 'flying off' each corner of the page are said to give movement and life to the page. Style three is 'horizontal'. Examples include the games reviews page in *Personal Computer World* magazine. Heavy rules are needed to carry this off and you don't want too many long headlines running the width of the page. Most magazines end up using mixtures of these styles.

Typography

Typography, layout and design are all interlinked, and two prime rules are: keep it simple, and don't cram things up. Leave space around the headlines (it's called 'working white'). Restrict the size of headlines to four or five text lines deep. The size of the headline and the length of the story reflect its importance. The best stories go near the top of the page. Often a lighthearted story in bold type will be used to 'hold up' the bottom of the page (as in *The Guardian*'s front page). On back pages a cartoon or crossword may be used.

Don't be tempted to use different headline faces in *Pagemaker* or whatever just because they're there. Try them out when they suit a feature piece or to give a particular section a different look. You might want to do this on a regular column for example. One bold story per page is enough: use it at the bottom or in a long column to hold the page together, especially where there is no picture. Picture captions are usually in bold type. Use the caption to lead the reader into the story.

Pictures and graphics

Pictures sell papers, and even on a low-budget magazine are well worth while taking time over. Even if you are doing the whole thing yourself and then photocopying the camera copy, it might pay to have a bromide made because the reproduction is so much better. Figures 4 and 5 shows the difference. How do you do this? First decide which parts of the picture to use. Take a sheet of paper and cut two L-shapes out of it. These used together form a frame. Move them around over the picture until you get the part you want. This will rarely be the correct size for your page. So attach a piece of tracing paper over the picture and trace a box over the area you want. Don't press too hard with the pencil or you'll damage the picture. Decide how big you want the picture to be on the page. Divide the width on the page by the width of the actual picture, multiply by 100 and you'll have the percentage reduction (or enlargement). Write this on the back of the picture and take it along to a local typesetter. They'll charge about a fiver for producing a bromide, which is the image broken up into dots (you can clearly see them if you look closely at a newspaper photograph).

If you can't afford bromides, photocopy the pictures to see how they will turn out. If the blacks aren't very solid, go over them with a black pen to improve the image.

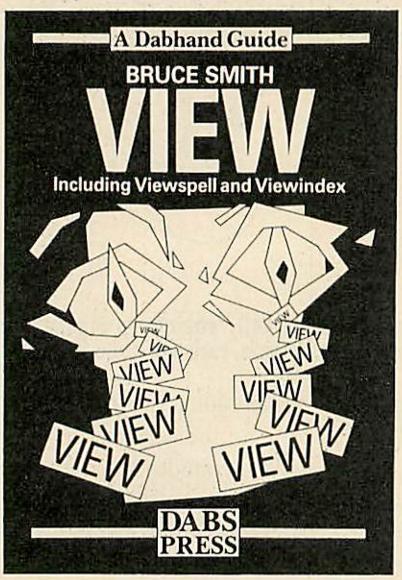
Pulling it all together

You know what goes on each page from the flat plan, but the next stage is pulling it all together for printing. Professional printers will do this for you. Simply supply the camera copy in page order with a flat plan showing what's on each page. If it's a book with some un-numbered or blank pages, point these out and mark them on the back.

VIEW GUIDE

AU OFFER

Bruce Smith's Dabhand book



Bruce Smith has covered all aspects of wordprocessing in this comprehensive guide to *View*.

The 240-page book covers: Command and Edit mode, Rulers and Margins, Saving and Loading text, Boot files, Markers, Formatting and Justification, Search and Replace, Stored Commands, Page layout, Printer Drivers, Macros, Handling Long Documents, Hints and Tips, *View* Manager, Machine Code utilities, *ViewSpell*, *ViewIndex* and OverView, Utility programs, *View* version changes, Quick reference, Printer Control codes and Technical notes. Applicable to the BBC B, B+, Master 128, Compact and Electron.

Please send me:

__________copies of *View A Dabhand Guide* at £12.95 (including p&p)

__________copies of book and 5.25-inch disc at £16.95 (£1.00 Discount)

__________copies of book and 3.5-inch disc at £17.95 (£2.00 Discount)

I enclose a sterling cheque/PO payable to Dabs Press for £______ (outside the UK add £2 p&p)

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ADDRESS

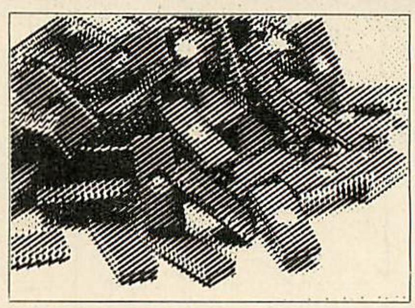
POSTCODE

Send this coupon with your remittance to Dabhand, Acorn User Merchandising, Redwood Publishing Ltd, 141-143 Drury Lane, London WC2B 5TF.

TUBELINK

AU OFFER

ExROM and UtilRAM



Tubelink, a part of Prestel Micro-computing, present two of their great products, ExROM and UtilRAM.

ExROM: The extension ROM. With ExROM fitted or loaded into sideways RAM, a model B or B+ micro has 27 extra * commands including the ability to *UNPLUG other ROMs. Included is a Tube-compatible 65C02 disassembler and fast Tube memory transfer commands.

For 6502 second processor users an extended Basic environment is provided in which routines can be called across the Tube and the assembler recognizes all of the 65C02 op-codes and can assemble directly to files, to I/O memory and to sideways RAM.

UtilRAM: The utility RAM. With UtilRAM loaded into sideways RAM you can configure your BBC B or B+ in almost exactly the same way as on a Master, to choose start-up values of screen mode, *TV, keyboard status, etc. For Epson-compatible printers, screen-dumps are provided. A versatile 10k byte sideways RAM printer buffer (which can be re-configured up to 63k bytes long, depending on available RAM) is also provided.

Please send me ______ copies of ExROM on 40/80 track 5.25-inch disc at £9.95 each.

Please send me ______ copies of ExROM on 16k EPROM at £14.95 each: the version of Hi-Basic I have is ______ 1983/1984/none (please indicate which).

Please send me ______ copies of UtilRAM on 40/80 track 5.25-inch disc at only £9.95 each.

I enclose my sterling cheque/postal order for £______ made payable to Tubelink.

NAME

ADDRESS

POSTCODE

Send this coupon with your remittance to Tubelink Offer, Acorn User Merchandising, Redwood Publishing Ltd, 141-143 Drury Lane, London WC2B 5TF.

For magazines you're printing with a photocopier yourself, care is needed. To understand how it will fit together, find a stapled magazine. (A 'perfect bound' magazine like *Acorn User* won't do, as that uses a very different process.) Open it up at the first page and write a big figure one on it. Turn over and do two, then three and so on up to eight. Pull out the sheets from the centre so you're left with the last eight pages and number these nine to 16. Remove the staples and look at which pages are on the same sheet of paper. First note that all right-hand pages have odd numbers. Also the total number of pages has to be divisible by four. The outer-most sheet is the cover (which isn't usually numbered). The first page is page one and on the same side of that sheet will be the last page, 16 as we've done it. On the other side of the sheet will be two and 15. The centre spread will be eight and nine. So when you prepare the photocopy masters they will have to be done this way. Practise on some photocopies of the artwork before pasting the real things into place. This might appear complex as you read it, and the only way to get the hang of it all is to actually do it.



Figure 4. Photocopy versus a bromide. The photocopy loses grey tones



Figure 5: The dot screening of the bromide keeps grey tones intact

Costs

If you go for typesetting from disc, you're talking about £5 per foot of galley with book width setting. Bromides of pictures are about £5 each again. The typesetter can turn out complete pages as bromides for about 10 per cent more. Your local photocopy shop will give you a quote for doing a magazine. But you can reckon on about £50 per 100 copies for a 16-page A5 magazine (four sheets of A4).

The Victory Publishing *Sideways RAM Guide* broke down approximately as in table 1 below.

Typesetting for cover and chapter headings	£ 100
Printing and laminating cover*	£ 350
Printing 2000 books with 240 pages*	£1700
Total	£2150

*Figures taken from *Wheaton Book Plan* from A Wheaton and Co, Hennock Road, Marsh Barton, Exeter.

Table 1. Cost of *Sideways RAM Guide*

The printing costs were worked out in advance approximately using a diary produced by the printers. There were extra charges on top for the cover as the printers had to lay tints on the black and white artwork we provided. If you want a full-colour cover using, say a transparency, you have to have film made: about £400.

This has been a very quick tour of publishing. So get some books from a library. But you'll only learn by doing it. If you're not going to do a book or magazine, try a birthday card, party invitation, or fancy notice for the office wall. We are interested in what you have produced so send in the results to *Acorn User* at 141-143 Drury Lane, London WC2B 5TF, and we'll pass the ideas on to readers.

If you want copies of the Spiderman page I did on *Pagemaker*, or the Stun page on *Fleet Street Editor*, send in a blank formatted disc with the format clearly marked and mark the envelope clearly as to which one you want.

Suggested reading: Hart's Rules for Compositors and Readers, Oxford Dictionary for Writers and Editors (both published by Oxford University Press) and the series written by Harold Evans (Heinemann) and also his Pictures on a Page.

SUBSCRIPTIONS

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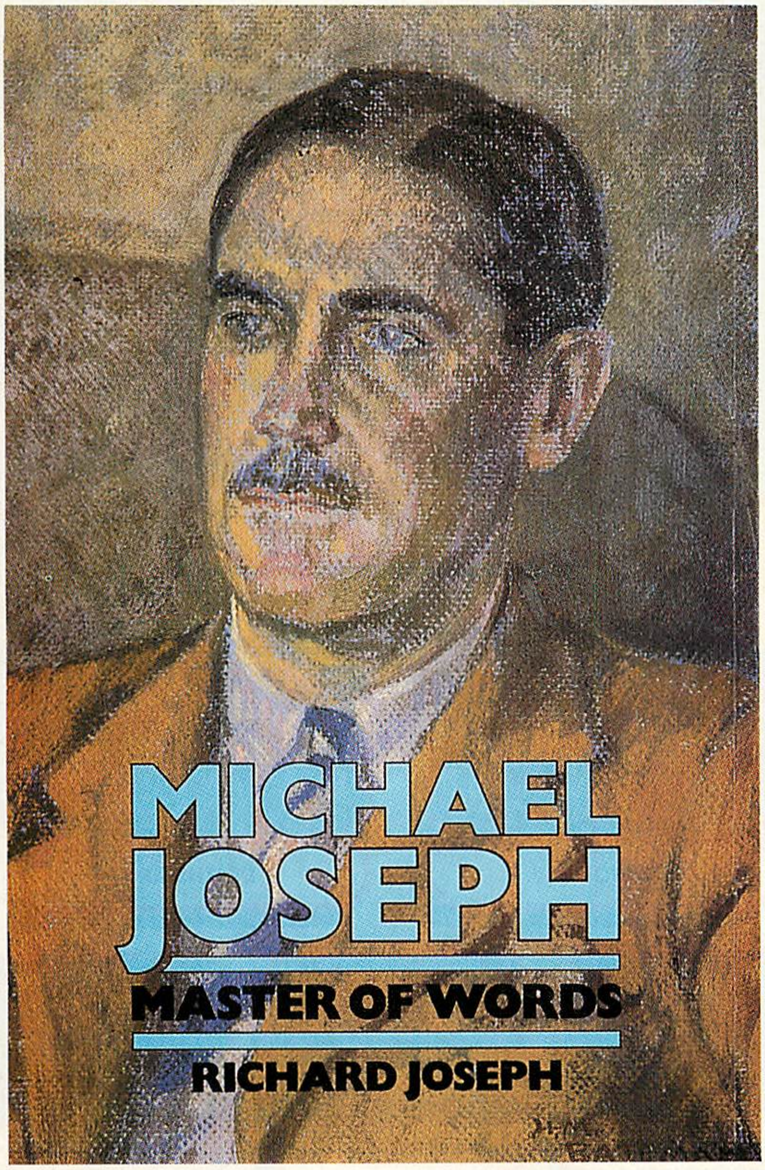
NAME ______ ADDRESS ______

POSTCODE ______

☐ I enclose my cheque/postal order for £17.50 made payable to Redwood Publishing ☐ Please debit £17.50 from my Access/Barclaycard/American Express

Account No: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐ Expiry Date ☐☐☐☐ SIGNED ______ DATE ______

Send this coupon with your remittance in an envelope to Gail Fairhall, Subscriptions Manager, Redwood Publishing Limited, Lambourn Woodlands, Newbury, Berkshire RG16 7TW.



BY THE BOOK

Literary works can be typset from *View* discs written on a BBC micro

[redacted]

Richard Joseph

Want to write a book? I did, but that was some three years ago now. The opportunity arose when the attic in my father's old home was being cleared out, and his 1930s cabin trunk full of memorabilia surfaced again.

It was packed with press cuttings, articles, short stories, photographs and numerous personal and business files. Here, I thought to myself, was the perfect starting point for a biography about my father.

My father had started the well-known firm of publishers, Michael Joseph Limited, back in September 1935. It is now owned by Penguin Books. During its lifetime the company has published many now famous authors. James Herriot, Dick Francis and Roald Dahl are just a few of today's household names. My research was to disclose many, many more.

I have a full-time job with one of the country's largest family-owned printing groups. One of the companies, Unwin Brothers Limited, has all the facilities to interpret and convert text on disc into conventional phototypesetting. So as marketing director for the group, I was more than obliged to use this technology.

Three years ago, Unwin's did not have a multi-disc reader to convert BBC discs, so the RS232 interface was the only route to the company's large Data General compu-

The Superior Collection Volume 2

For the BBC Micro



A New Concept in Compilations

The Superior Collection Volume 2 features one brand new game, Kix, together with 7 of Superior Software's smash hits for the BBC Micro.

Kix is a fascinating strategic game in which you play the role of the intrepid Kix, whose objective is to take control of each of 20 quadrants; you must cover at least 75% of a quadrant's area in order to seize power over the entire quadrant. You can choose to move quickly or, to earn extra points, take a slower pace — but be ready to speed up immediately if you get cornered. The quadrants are guarded by Tracers who are aided and abetted by the fast-moving Fuse. Two excellent soundtracks add to the atmosphere of this fantastic game, which is worth at least £7.95 in its own right.

BBC Micro dual cassette	£9.95
BBC Micro 5¼" disc	£11.95
BBC Master Compact 3½" disc	£14.95

Here's what the computer press said about some of the other titles on this compilation package:—

REPTON 2: "Repton 2 is better than anything I've played on the BBC Micro or Electron. Brilliant!" . . . ACORN USER

DEATHSTAR: "Deathstar is a super fast, all action arcade classic. It's the sort of game that you can't put down . . . The graphics are excellent and the scrolling is very smooth in all four directions. The pace is fast and furious even on the starting screen. This action packed game is recommended for all arcade gamers." . . . ELECTRON USER

SPACE PILOT: "The professional presentation — well up to the usual Superior standard — coupled with the incredible addictiveness makes Space Pilot a must for all shoot'em-up fans.

Instructions	65%	
Playability	95%	Awarded
Graphics	90%	★★★★★
Value for Money	65%	(Top Rating)"

. . . HOME COMPUTING WEEKLY

CRAZY PAINTER: "Great sound and graphics, smooth and accurate animation, responsive and simple controls.

Instructions	70%	
Playability	100%	Awarded
Graphics	100%	★★★★★
Value For Money	100%	(Top Rating)"

. . . HOME COMPUTING WEEKLY

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```
Codes used include:

<G100><G1>      1pt horizontal rule to 27em measure.
                11pt vertical drop.
                18pt Baskaville ITALICS U/L - centred.
                Heading includes 2/3 lines. Each line
                     end will have <C
                But running headline must be in ONE
                     single line
                Change size to 24/25pt
                30pt vertical drop.

<G2>            24/25pt Baskaville ITALICS U/L - centred
                24pt drop
                Set on 20ems measure.

<G3>            Change size to 10/11pt ITALICS and
                centre - on 20ems measure.
                Change face & size to 11/12pt.
                Baskaville ROMAN, JUSTIFIED to 27ems.


<P11,12>        Text body size.
<P9,10>         Captions for photos.
<P8,9>          Text in Biblio


<E              End of Paragraph
<L              End of line
<C              Centre that line
<K              Quad right, preceding line
<IX             Hanging Indent - unspecified amount


<R              Change to roman
<I              Change to italic


<EL4.5>         Vertical space - 4 1/2 pts in Biblio.
<EL6>                          - 6pts  Between paragraphs.
<EL9>                          - 9 pts line spacing.
<EL12>                         - 12pts Above and below quotes.
<EL18>                         - 18pts Between asterisks &
                                       next line of text.
```

Figure 1. Some of the typesetting codes used for producing the book

ters. Once the book was edited and corrected, I intended to put codes into the text so that a printer could interpret them and substitute specialist typesetting commands.

I had a preference for the BBC micro, but it was, at the time, one of several choices open. Any micro would do, providing it had a disc drive, an easy-to-use wordprocessor, an RS232 and a printer.

I visited several dealers, but the one I found most helpful was Microwise in Reading. I gave them the specification and they suggested a BBC system. More importantly, they went so far as to set up a system that would meet my requirements.

They suggested a Mannesman Tally MT80, a single disc drive (which later turned out to be very time-consuming) and *View* 1.4 (well, it was three years ago!). Following a successful demonstration and filled with high hopes, I bought the system. The book I planned would involve typing extracts, so with this in mind, I added an Ashgoal copy holder with a cursor which is pneumatically controlled by a foot pedal. (From Ashgoal Ltd, 40 Ventnor Drive, London N20 8BP at £79.50.) I found it very effective.

Right from the start, I realised how much technology was going to help me. Time would be limited to the snatched hour or so each evening and weekends.

I'd planned the book to be about 80,000 words long with an index, bibliography and introduction. Each chapter should ideally be about 8-10,000 words long – requiring with *View*, on a standard BBC B micro, about 82 files in all (and the same again for the back-up copies).

Many months later, when I was writing, I realised that the memory had to be extended. So I purchased a 32k RAM board from Watford Electronics. This made editing easier – and I was able to merge the files together. After a while, a fault developed, causing the screen and memory to crash, but a phone call and a visit to Watford put that right.

I also added Beebugsoft's *Spellcheck II*, but the time taken to process was far too slow, and the dictionary too small. With a large number of files to process, it was clearly going to be easier to rely on the services of a professional reader/editor.

I found that *View* 1.4 had a few curious faults, but nothing that I could not allow for, and overcome. The most annoying error occurred when formatting solid set *unjustified* text in mode 3. All the paragraphs below the cursor would cancel and result in one solid block of text. The way round this was to insert a line space at the end of the piece being corrected, before reformatting, then remove the added line.

The Mannesman printer proved strong enough for the work of printing out the text for reading and checking. I consumed at least 10,000 sheets of fanfold paper, before the final version was presented to the publisher. And though the printer kept going, the ribbons were far from long-lasting. Despite manufacturers claiming 600,000 characters before the ribbons lost the crisp black image, I found that the image became barely legible after only 300 pages of double-spaced output. In this case, that's about 360,000 characters.

Ashford Press Publishing, who took on this biography, agreed to accept the text on discs, provided they were fully coded for typesetting. I agreed to do this and payment was to be additional to the contractual royalties for the book.

Luckily, they decided to use my own firm Unwins to do the typesetting. This made it much easier for me to do this part of the work.

The first step was for the book designer from Ashford Press to supply specimen page layouts marked up for typesetting. These included all the sizes of type to be used, with the spaces and positioning indicated. I suggest that authors outside printing or publishing who do not understand these should send the layouts to the typesetter or printer undertaking the work. They will be very pleased to mark the layouts with the correct codes. Printers who accept coded discs can provide guidance notes on how to code your data.

I began to encode the text to meet the typesetter's requirements. At this point, I must make it quite clear that the codes mentioned here do not form, in themselves, computer instructions which automatically drive a typesetting machine. They must be interpreted by experts at the

```
<G100><G1>Chapter 1<Z


<G2>The Private Life<C
of a Public Man<C
1897+en1958<Z


<G3>"Authors are easy enough to get on with, if you are
fond of children'. <C<RMichael Joseph, Strand Magazine
1949<Z


<P11,12><RMoss and Rebecca Joseph were living at 130
Osbaldeston Road in North London when they decided to
start a family. Moss, a man of many interests, had led
a varied life up to 1897 and was to continue doing so.
He was not settled in any profession, nor was he an
academic and his life style was not one which was
conducive to encouraging any literary minded
offspring.<E<EL6>
<MEarlier in his life Moss had been employed in the tyre
business with the Davies Tyre Company. A restless man,
he soon left this occupation for an entirely different
one in the cinematic world. He and his two brothers,
Godfrey and Lionel, were involved in running a cinema
near Marble Arch but this turned out to be another
short-lived venture. They received a number of
criticisms from the audiences that the flickering
images gave them headaches. Not surprising for the
speed of the film through the projector was then only
sixteen frames a second. Today, the standard speed is
twenty-four frames. Hence the expression 'going to the
flicks' became a common phrase. Moss thought about
this and grew apprehensive that these flickering
images on the screen might eventually make people go
blind, and for that reason quit the business before
the complaints became serious.<E<EL6>
```

Figure 2a. A *View* page showing various codes

Chapter 1

The Private Life
of a Public Man
1897–1958

'Authors are easy enough to get on with, if you are fond of children'.
Michael Joseph, Strand Magazine 1949

Moss and Rebecca Joseph were living at 130 Osbaldeston Road in North London when they decided to start a family. Moss, a man of many interests, had led a varied life up to 1897 and was to continue doing so. He was not settled in any profession, nor was he an academic and his life style was not one which was conducive to encouraging any literary minded offspring.

Earlier in his life Moss had been employed in the tyre business with the Davies Tyre Company. A restless man, he soon left this occupation for an entirely different one in the cinematic world. He and his two brothers, Godfrey and Lionel, were involved in running a cinema near

Figure 2b. Top part of the printed page

printers or typesetters to conform with the publisher's layouts.

The coded data can look like:

<G1> Want to Write a Book?<Z

which has to be a certain typeface and size, specified by the publisher, and in a certain position on the page. There are many variations of coding used in the printing industry, with each major company promoting its own. In relatively simple text, *Wordstar* software can be used, but printers usually supply their coding free of charge. So if you intend to have printing done this way, contact a printer or typesetter earlier rather than later in your work. The interpretation of codes is usually done only at companies which have a trade agreement to do so.

Some say that ASPIC (Authors Standard Pre-press Interfacing Codes) which are recommended by the British Printing Industries Federation are best, but the method has not yet really caught on (see *Acorn User* page 169 July 1986). The main reason for the apathetic approach by the printing trade to a 'standard' is that the devices and software used for interpreting codes are so flexible that they can accommodate any coding structure.

The first point, I learned, was that the text was best provided in unjustified form; that is ragged right. I was asked to insert, at the start of each file, <G100>. The operator of the typesetter would substitute *the typeface* – in this case Baskerville, the size was 11 on 12 point and the width of each line or measure as printers call it (27ems) and other instructions. The code could equally be [Start 1] or alternatively <Begin 1>. Starting with <G100> allowed me to have up to 100 different layouts for typesetting within one file, but in practice there are seldom more than 10.

The start of each chapter called for additional codes so that the typeface and size could be changed. Each level of heading required a G to start and Z to end – as shown below:

<G1> Chapter 1<Z

The typesetters at Unwins created a SARA (Search and Replace Automatically) table on their *Miles 400* software to insert the appropriate typesetting commands (and to sort out any bugs). This is where the expert printing knowledge is called for. Figure 1 shows some of the codes used to achieve the finished result. Incidentally, this software can handle up to a staggering 1081 search and replacements concurrently.

The other real benefit from using the *Miles 400* system is that the staff can program the software to make up the pages automatically, with the running headlines inserted at the top left or right of each page. These were picked up from the chapter starts, but the typeface and size changed to a smaller size.

The publisher wanted illustrations inserted in the text and pages had to be left blank at certain points in the book. Once the publisher had chosen the illustrations, the relevant reference points in the text were located and the code <ID> was inserted. In reality, any code would do, so long as the 'flag', in this case '<', was a unique character unused anywhere else in the job. The *Miles* system then worked out where the page had to break for the whole page blank to be 'set'. To make it more difficult, all these had to start on right-hand pages. But the system inserted the page numbers as it went along.

I did run into some problems. When the text came back to me for checking, a number of large chunks were missing, though these were still on the discs sent to them. What had happened was that I had not been consistent with the rulers used in *View*. I used these to indicate the quoted extracts to make it easier to read for the publisher. These are transparent and were not printed on the output sent with the discs. On investigation I found that at the top, I had set two different types of ruler.

This seemingly innocent variation in the positioning of the asterisks as tab markers was not seen by the typesetters, as it did not appear on the printout. They instructed the *Miles* system to remove all values from:

. . > . . to . . . <

thus stripping out the default ruler from the data on the disc. So when *Miles* read:

. . > . . to . . * <

it did not recognise this end command and removed all text until . . . < occurred at the end of the next ruler. This was simple to rectify, but it was very annoying to have to do it at the proof stage.

Once all the last minute corrections had been carried out and entered, it took only

3½" 'COMPACT' versions of CJE software available £2 extra.

CJE micro's

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Simple to use, standard EPSON codes for Underline and Doublewidth used.

After initialising Multi-Font NLQ with a '*MFNLQ', Multi-Font NLQ is normally transparent to the user. Multi-Font does claim some memory for workspace and storing font data.
Multi-Font NLQ comprises of MFNLQ ROM for the BBC, and utility disc containing the FONT definer, ten fonts, BASIC demonstration program, VIEW demo text file and Driver.
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Ten fonts are supplied or create your own using the font definer supplied.

Fonts included are:-
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For Canon & Taxan Kaga users we recommend FONTAID in preference to Multi-Font NLQ.

Multi-Font NLQ (ROM and 40/80 Disc)	**£30.00**
Additional font disc 'MF-B' (12 fonts)	**£15.00**
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P & P on MFNLQ	**£ 1.00**

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MASTER Write Protect and ROM select switch. Two switches set to RAM slots to be:-
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This is Standard
This is COURIER
This is ITALIC
This is GOTHIC
This is COMPTS
This is BOLD
This is SHADOW
This is OUTLINE
This is BRDWAYE
This is THEATRE

EXAMPLE OF MFNLQ FONTS

FONTAID

NLQ Definer for Canon & Taxan Kaga NLQ Printers.

Design your own NLQ Fonts or 'download' one of our 40+ predefined fonts.

Fonts can be downloaded within Wordwise, Inter Word or VIEW Documents allowing different fonts to be used for different paragraphs, or even individual lines of text. During downloading your Program or Text will not be corrupted.

On the FONTAID standard font Disk are the following eight fonts:- Square, Outline, Italic, Gothic, Computer Type Style, Bold, Shadow, and Broadway Engraved.

Additional disc 'A' gives an extra 11 fonts including:-
Greek/Maths, Plain, Hand & (Elite, Condensed, & Super Condensed).

Now included is a facility to issue '*' commands within a VIEW document.
To download new fonts within VIEW documents, the FONTAID ROM needs to be fitted in the BBC. (All other FONTAID facilities are available on both the FONTAID ROM & DISC). Fonts are always downloaded from Disc.

Fontaid is recommended to Canon & Taxan Kaga owners in preference to Multi-Font NLQ. As downloadable NLQ is a built-in facility of the Printer, full access to all the printers control codes is still allowed. The resolution of the FONTAID NLQ is also slightly higher than that of Multi-Font NLQ.

FONTAID requires 6264 RAM chip in printer.

FONTAID ROM & STD Font disc	(40 or 80 track)	**£30.00**
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CJE micro's

```
<G200><G2>Index<Z

<P8,9><RAberconway, Lady<LF178, 193<JY
<IAbyssinian Tragedy<R<LF134<JY
Acacia Road<LF18, 93<JY
<IAccount Rendered<R<LF74, 76<JY
<IAcross the Frontiers<R<LF140-1<JY
<IAdelaide Register<R<LF49<JY
Adriatic (Sea)<LF21<JY
<IAdventure of Publishing, The<R<LF58, 202, 204<JY
<IAfrican Queen, The<R<LF128<JY
Air Ministry, The<LF166<JY
Aldershot<LF97<JY
Allen, Fletcher<LF166<JY
Allen, Walter<LF81, 153, 203<JY
Allingham, Margery<LF133, 160<JY
America<LF<ISee <RUSA<JY
<IAnd Jesus Wept<R<LF136<JY
Anderson, Sherwood<LF116<JY
Anderson Shelters<LF160<JY
<IAnimal Life<R<LF103<JY
<IAquitania, <RRMS<LF152<JY
Arlen, Michael<LF49, 104, 116, 131<JY
Army Officers' Emergency Reserve<LF91<JY
Army Pay Corps<LF155-6<JY
Arras<LF86, 89<JY
Asquith, Lady Cynthia<LF13, 147, 148<JY<HI1>
Associated Bookseller of Great Britain & Ireland<LF81,119<JY<E
Attenborough, John<LF204<JY
<IAt The Sign Of The Mermaid<R<LF215-16<JY
Aumonier, Stacey<LF45-6, 52, 104<JY
Australia<LF47, 91<JY
<IAuthor, Playright and Composer<R<LF50<JY
<IAutobiography of a Journalist, The<R<LF57<JY
<IAvondale, <RHMS<LF21<JY
Ayckbourn, Alan<LF210<JY<EL9>
Baker, A.<LF47<JY
```

Figure 3a. Illustration of coded index

Index

Figure 3b. Part of a page from the actual index

10 minutes to typeset the entire book.

Figures 2a and b show some of the codes I used in position, and the interpretation the printers used. They deal with straightforward text.

I could have coded the names and titles in the text to be used by the *Miles* software to create an index automatically. However, as I had an index already built up, all that had to be done was to encode the lines. The codes used suit *Miles* and though they look complex, are really quite straightforward (figures 3a and b). All the excess spaces were removed on *View*, saving the typesetter the unnecessary task of removing them which speeded up the processing time. I also coded the bibliography. This was more complex, but all I had to do was to follow the recommended codes.

Some of my golden rules for coding the book are shown in the box (right). But it is best to leave the coding until after the typescript has been accepted by the publisher. If they are included, reading the draft can be very confusing.

Nearly all typescripts are edited anyway, so the coding can be done at the same time. Major book publishers have yet to learn that authors are usually quite happy to execute the editor's changes, and can encode at the same time, but they do deserve to be paid for their work.

While talking about the typescript, I recommend that double line spacing is used, as this makes proof-reading and subsequent correction much easier.

Once you have started to insert the codes, another tip is to create a test file of, say, 10 pages or enough to be fully representative of the book, and send that off to the publisher. They will send it to the printer for checking and testing purposes. The test disc should also include a complete keyboard strike of the micro you are using. This allows the printer to convert the ASCII values if there are changes to be made. Further, they will use this to typeset specimen pages, and this will help the publishers assess how the book will look when it is finished.

When you have finally completed all the coding, print out and check thoroughly. I cannot stress this point enough. Once the discs are in the hands of the printers there is little you can do about alterations without incurring major author's correction costs. One way to spot errors in coding is to highlight the codes with a yellow highlight pen. As you do this, the inconsistencies and errors become clear.

When sending the discs off to the publisher or printer, certain other basic formalities must be observed. For example, all the discs should be clearly labelled with the filenames. A typed sheet should list the discs being sent and the filenames on them. A total word count helps the publisher to establish how many pages the text will make in the finished typeset form. If your micro cannot do this, then the total number of bytes involved will do.

A complete dump of the text is useful to the printer, especially if there are tables and complex pieces of typesetting to be done. If there are errors, they can be dealt with more easily and quickly if they have hard copy to refer to.

The final result was a 256-page biography, liberally illustrated and professionally put together. It has been an immensely rewarding and exciting project. Now I'm tempted to do another.

Richard Joseph is marketing director of the Unwins printing group and biographer of his father, publisher Michael Joseph.

HANDY HINTS

- Text should be typed unjustified – that is, ragged on the right margin.
- All codes, and typing, must always be consistent throughout.
- Unlike typing letters, only put one space between sentences.
- Do not highlight, underline or condense text.
- Do not use lower case 'l' for one, or 'O' for zero.
- Spaces should not be added after the codes at the end of paragraphs.
- Most micros, including the BBC machine, have the same keys for both open and closed quotation marks. Properly typeset text has different open and closed symbols, so to enable a successful conversion, use a double to start, and a single to end. Where double quotation marks are required in the finished typesetting, use " " to start, and " ' to end. Make a note of how you differentiate these and tell the typesetter.

SOFT OPTIONS

There's plenty of choice in software to set up a BBC micro and printer for home publishing

Clive Williamson

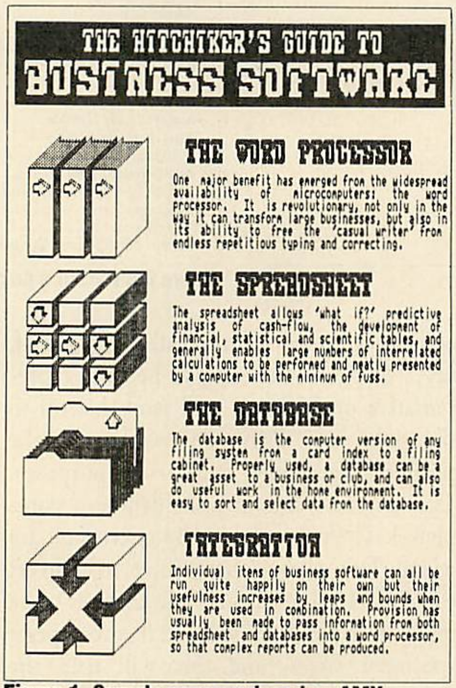
There's no doubt about it, desktop publishing (DTP) is flavour of the month with computers and the printed word. But a proper DTP system needs a really beefy micro with lots of memory, and a laser printer – a set-up which is way beyond most people's budget. So what can the BBC micro owner do to spruce up printed output?

Fortunately, a number of inexpensive paths are open, from the glamorous approach of getting your wordprocessed files phototypeset from disc, down to improving the look of text from standard printers by making the best use of their built-in features. New software can even breathe life into an exhausted and outdated dot-matrix model by giving it lots of interesting new 'near letter quality' (NLQ) fonts. Then there are a number of programs that let you create complete magazine-style pages, each incorporating graphics, text in various sizes and typefaces (figure 1), and even digitised photographs and drawings.

The printer

Whatever your wordprocessor, there is usually a relatively easy way to obtain bold and underline effects and the range of different typefaces offered by most printers. Whether you have *Wordwise*, *Wordwise +*, *InterWord* or *View*, you can send special codes to the printer, known as control codes, and these do the job of switching the printer's functions on and off.

Dot-matrix printers have the greatest variety of built-in typefaces and effects (a complete list for Epson-compatible models was given in the August edition of *Acorn User*, page 59) and if used wisely these can greatly enhance your work. Daisy-wheel printers only usually offer bold and underlined text, but different typefaces can be obtained by changing the wheels themselves, and some also support microspacing, which can give very professional-looking results when printing right-justified text (where the length of each line of print is adjusted so that the right-hand margin is straight).



THE HITCHIKER'S GUIDE TO BUSINESS SOFTWARE

THE WORD PROCESSOR

One major benefit has emerged from the widespread availability of microcomputers: the word processor. It is revolutionary, not only in the way it can transform large businesses, but also in its ability to free the 'casual writer' from endless repetitious typing and correcting.

THE SPREADSHEET

The spreadsheet allows 'what if?' predictive analysis of cash-flow, the development of financial, statistical and scientific tables, and generally enables large numbers of interrelated calculations to be performed and neatly presented by a computer with the minimum of fuss.

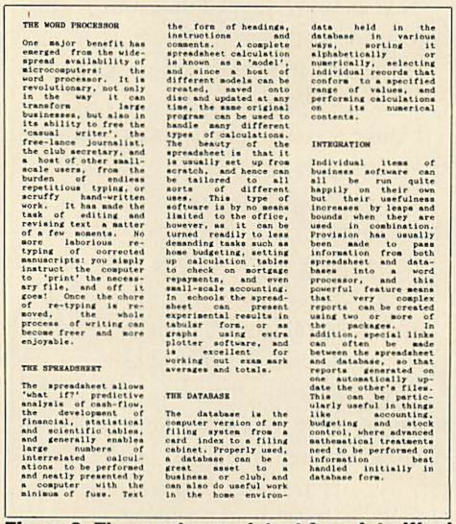
THE DATABASE

The database is the computer version of any filing system from a card index to a filing cabinet. Properly used, a database can be a great asset to a business or club, and can also do useful work in the home environment. It is easy to sort and select data from the database.

INTEGRATION

Individual items of business software can all be run quite happily on their own but their usefulness increases by leaps and bounds when they are used in combination. Provision has usually been made to pass information from both spreadsheet and databases into a word processor, so that complex reports can be produced.

Figure 1. Sample page produced on AMX *Pagemaker* using fonts from *Extra! Extra!*



THE WORD PROCESSOR

One major benefit has emerged from the widespread availability of microcomputers: the word processor. It is revolutionary, not only in the way it can transform large businesses, but also in its ability to free the 'casual writer', the free-lance journalist, the club secretary, and a host of other small-scale users, from the burden of endless repetitious typing, or scruffy hand-written work. It has made the task of editing and revising text a matter of a few moments. No more laborious re-typing of corrected manuscripts: you simply instruct the computer to 'print' the necessary file, and off it goes! Once the chore of re-typing is removed, the whole process of writing can become freer and more enjoyable.

THE SPREADSHEET

The spreadsheet allows 'what if?' predictive analysis of cash-flow, the development of financial, statistical and scientific tables, and generally enables large numbers of interrelated calculations to be performed and neatly presented by a computer with the minimum of fuss. Text the form of headings, instructions and comments. A complete spreadsheet calculation is known as a 'model', and since a host of different models can be created, saved onto disc and updated at any time, the same original program can be used to handle many different types of calculations. The beauty of the spreadsheet is that it is usually set up from scratch, and hence can be tailored to all sorts of different uses. This type of software is by no means limited to the office, however, as it can be turned readily to less demanding tasks such as home budgeting, setting up calculation tables to check on mortgage repayments, and even small-scale accounting. In schools the spreadsheet can present experimental results in tabular form, or as graphs using extra plotter software, and is excellent for working out exam mark averages and totals.

THE DATABASE

The database is the computer version of any filing system from a card index to a filing cabinet. Properly used, a database can be a great asset to a business or club, and can also do useful work in the home environ- data held in the database in various ways, sorting it alphabetically or numerically, selecting individual records that conform to a specified range of values, and performing calculations on its numerical contents.

INTEGRATION

Individual items of business software can all be run quite happily on their own but their usefulness increases by leaps and bounds when they are used in combination. Provision has usually been made to pass information from both spreadsheet and databases into a word processor, and this powerful feature means that very complex reports can be created using two or more of the packages. In addition, special links can often be made between the spreadsheet and database, so that reports generated on one automatically update the other's files. This can be particularly useful in things like accounting, budgeting and stock control, where advanced mathematical treatments need to be performed on information best handled initially in database form.

Figure 2. Three-column printout from *InterWord* in Epson LQ800 NLQ mode

Wordwise and *InterWord*

Wordprocessors all have different ways of sending the necessary control codes. For example, *Wordwise* and *Wordwise +* both have an OC command (standing for output control). So, the codes needed to turn on the emphasised or bold effect on an Epson-type dot-matrix printer are:

27,69

In *Wordwise* use:

f1OC27,69f2

and to turn the effect off again:

f1OC27,70f2

Things are much simpler in *InterWord*, which has a pull-down menu of control codes already set up for Epson printers, and this can be changed to suit any other make or standard. *InterWord* is a WYSIWYG or a 'what you see is what you get' wordprocessor, so you can see your page layout on the screen (complete with page breaks – a real advantage) including all the bold, underlined and centered effects available from the function keys. An added bonus of *InterWord* is that it can produce multiple column printouts, rather like a newspaper (figure 2). You can even leave gaps to insert graphics or photographs in the text.

View printer drivers

The *View* wordprocessor takes a different approach to printer control. Here, a printer driver program must be loaded into the wordprocessor, and this sends the correct codes to achieve the desired results at the printer end. Bold and underline effects are simply selected by placing the required section of text between two of *View*'s highlight characters. Highlight-1 (Shift-f4, which appears on screen as a dash '–' character) is used to switch underlining on and off, while highlight-2 (Shift-f5, which appears as a star '*') selects bold.

Printer drivers are available for a number of popular types of printer: Epson; Juki; Facit; and Ricoh, and you can make up your own using Acorn's *Printer Driver*

Generator program. In the case of the Juki 6100 daisy-wheel, the printer driver gives microspacing control as well, while on the Epson dot-matrix printers an extended range of effects can be obtained using a feature obscurely known as extended highlights. This gives access to a much wider range of printer effects such as superscript, subscript, italics and alternative fonts, and you can also get at special characters such as accented letters (figure 3). This is all done through the combinations of the two highlight characters shown in table 1. To make *View* respond in this way, redefine one of the highlights at the beginning of each file using the HT stored command:

HT2 130

One problem with *View*'s Epson driver is that it resets all the printer functions each time it prints, so if you have managed to switch your FX80 to a special font from Basic (eg, VDU 2,1,27,1,15,3 would switch on condensed print) the changes are lost immediately you issue a PRINT or SHEETS command from *View*! To avoid this it's a good idea to make up your own version of the Epson driver with the *Printer Driver Generator* using the 'answerfile' called A.FX4. This is a set of ready-made answers to the questions posed by the *Printer Driver Generator* software about your printer. Make sure you respond 'N' for no for the very first question 'Include printer initialisation?' Then you can use the same answers as the answerfile throughout the work.

You are then free to set up your printer to any required typeface or effect from Basic (such as proportional printing, italic or double strike) and these effects should be preserved when you go to the *View* word-processor and begin printing.

It all boils down to the fact that it is well worth getting to grips with printer control codes, because your text can look far more attractive if you pay careful attention to the layout, choose a nice typeface (NLQ if it's available) and use effects such as bold text to full advantage. Make the best use of what you've got.

Software

All this talk of control codes can be pretty daunting to the beginner – let's face it: printer codes are the antithesis of user-friendliness – so it's lucky that a number of software manufacturers have stepped in to make life easier. One really useful example of printer software is *Printmaster* by Computer Concepts. It's been around for some time now, but it is still one of the best products of its kind. Designed to work mainly with *Wordwise +* and Basic language programs, it is a set of star commands in a plug-in ROM chip. Instead of typing in all those horrible numbers use:

*STYLE M

for emphasised (bold) text, or:

*PROPORTION

to turn proportional spacing on. The commands have to be placed between the usual green and white embedded command markers of *Wordwise* using function keys 1 and 2. All the common printer functions are catered for, and there is a general *PCODE

TEXT PRINTED IN THE STANDARD ROMAN FONT
ON AN EPSON LQ800 PRINTER

Italic, superscript and subscript
and, of course, underline are possible.

This is the same printer with the ESC/P
Identity Module fitted, which allows a
greatly extended character set:

J'espère que tu as déjà reçu ma lettre.
Dieser Stück Kuchen ist sehr schön!

(This is in *SANS SERIF*, from one of the
extra plug-in Font Modules.)

Figure 3. Special and foreign-accented letters from *View* using Epson Printer Driver

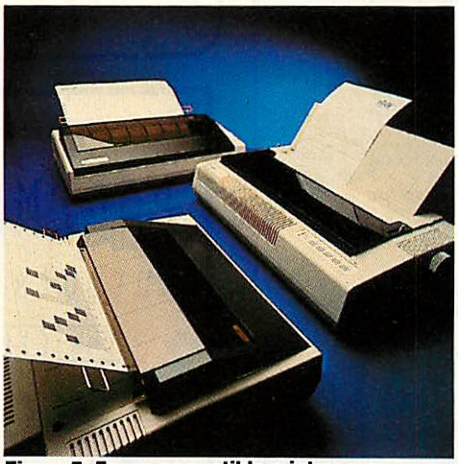


Figure 5. Epson-compatible printers can produce many and varied typefaces

command which can send any specific code sequence. These features are by no means limited to *Wordwise +* users – you can send the commands from the command screens of *View*, *ViewSheet* and so on. One of the major benefits of *Printmaster* is its ability to print enlarged text and graphic images from any screen mode in a range of sizes and positions on the paper, and this feature opens up lots of possibilities for designing posters, or pages for club or school magazines.

Technomatic now make a similar ROM to go with *Wordwise +* and Basic called *WYSIWYG+*. This also replaces the cumbersome Epson code sequences with simple star commands, and it includes some slightly different functions that take advantage of features on some of the newer Epson models. There's also a way of pausing the printing at a preset point from Basic (so that a daisy-wheel can be changed), and a method of incorporating graphics in a printout so that, for example, letter headings can be specially designed and inserted at the top of each page with a *GRAPHICS command when working with a dot-matrix printer. The latter is a very nice feature, but it's a very slow process, as the graphics have to be built up dot by dot.

When previewing *Wordwise +* text in

This is Fontwise+ Font number 1
This is Fontwise+ Font number 2
This is Fontwise+ Font number 3
This is Fontwise+ Font number 4
This is Fontwise+ Font number 5
This is Fontwise+ Font number 6
This is Fontwise+ Font number 7
This is Fontwise+ Font number 8
This is Fontwise+ Font number 9
This is Fontwise+ Font number 10
This is Fontwise+ Font number 11
This is Fontwise+ Font number 12

Figure 4. Range of typefaces available on Epson-compatible printers from *Fontwise +*

Highlight	Effect
–	Underline
***	Bold
*	Select extended character set
*_	Turn subscript on
**	Turn superscript on
**_	Cancel superscript of subscript
*__	Select alternate font
_	Italics
*___	Reset all functions to off
--	Used by *ViewIndex*

Table 1. Effects on Epson-compatible printers when using extended highlights from *View*

mode 3, *WYSIWYG+* gives a rough indication of how effects such as bold, underline and italic will look – hence its name.

Font wise?

Most dot-matrix printers now include at least one NLQ font, but you may find that a different font suits some of your applications better. You might be designing a party invitation and want something a bit special, or perhaps making up a magazine using the traditional 'cut and paste' method, and need a different print style for headings, or simply to make a point. Luckily, it's now possible to take advantage of the graphics ability of some dot-matrix models to reproduce an amazingly wide range of typefaces.

Fontwise+ is an interesting piece of disc software from Clares, which allows *View*, *Wordwise*, *InterWord*, *Edword 2* and *Mini Office II* files to be read into the micro, reformatted, and then printed out on an *Epson*-compatible printer using a range of 12 fonts.

There is no way to preview the results other than printing out, so you can get through quite a lot of paper at first, but the results are very good indeed (figure 4). Especially nice is the microspacing option, which produces very readable results: things always scan better when the eye doesn't have to jump over uneven gaps between letters and words. Despite working in graphics mode, the printouts are quite fast, and a new utility – the *Fontwise Font Editor* – contains 10 extra fonts and a program to help you define your own typefaces or edit the existing ones. *Fontwise* printouts can be done in normal, magnified or condensed sizes on Epson FX, RX and LX models, or in normal size only the MX series printers.

A ROM-based option that gives NLQ fonts in this way is the PMS *Multi-Font NTQ* ROM. Here text can be reproduced in a range of NLQ fonts up to 16 times normal size (that's about 4cms high!) Backgrounds, inverse effects, adjustable character pitch and width, and microspacing are all incorporated. The starter pack has three fonts supplied in the main program ROM (£35 including postage), and further sets of four fonts can be ordered in total from the range of 32 in total, at £9.50 per extension ROM. The original *Multi-Font* ROM was designed to work with quad-density graphics (Epson FX and RX models onwards) but the demand was such that PMS has released a special version for users of MX-compatible printers so that they can take advantage of the dual-density graphics mode (figure 6).

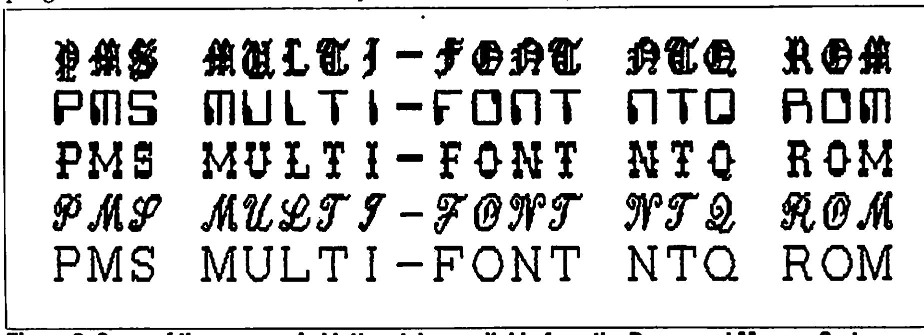


Figure 6. Some of the many varied letter styles available from the Permanent Memory Systems *Multi-Font NTQ* ROM

Cut and paste

Having talked a lot about dot-matrix printers, it's worth remembering that if you use either a Ricoh Flowriter 1600 or a Juki 6100 daisy-wheel model you can get some very good results from *View* by installing the correct printer driver, selecting justification and the microspacing option, and making up your own 'galleys' to whatever column width you require.

This looks excellent, especially if you use bold headings. Then you can make up your page layout using the old 'cut and paste' method, leaving gaps where appropriate for photographs and diagrams.

Details

If you are preparing printed material with a view to publishing it in some way – be it at a printer or by photocopier – the last thing you want is to run off 1000 copies and find a spelling error! That's were spell-checking programs like *ViewSpell* and *Spell Master* are worth their weight in gold.

The former is part of the *View* family, and its 70,000 word dictionary works on text files once they have been saved to disc. The dictionary is disc-based, so it's often best to go and put the kettle on while the program does its work, whereas *Spell Master* has its main dictionary in ROM, making it faster. So fast, in fact, that it can be left active all the time, in which case it will 'beep' a warning every time it sees a word it does not recognise. This is frankly amazing, especially as you can then access a menu that lets you browse through the dictionary looking for the correct spelling, or use the *FUZZY command to obtain a 'fuzzy match' – all the words in the dictionary that nearly match a specified word – for something you are not sure about. However, second processor users should be warned that the *Spell Master* program isn't Tube compatible, whereas *ViewSpell* is.

Don't forget that spelling checkers aren't foolproof. They cannot find cases where a correctly spelled word appears in the wrong context ('the car over their') or appears twice – so make sure you read through your work very thoroughly before you commit anything to print. Better still, have someone else check it too!

Desktop publishing

The idea of mixing text and graphics on a single page is very attractive, and despite the limitations of screen resolution, the BBC micro can produce impressive results.

Of course the printouts will always have that chunky look about them, as they can only reproduce dot for dot what is on screen, rather than giving smooth letters and graphics as found on the Macintosh Laserwriter system. But desktop publishing on the BBC micro is well worth considering, if only because it can give such a good insight into the way the 'real thing' works. That makes it ideal for educational applications and similar.

There are two desktop publishing programs currently on the market – AMX *Pagemaker* (£49.95) and Mirrorsoft's *Fleet Street Editor* (£39.95). Both have a WIMPs environment (windows, icons, menus and pointers), making them fairly user-friendly, and they can both be driven from a mouse. The programs let you control the design of the finished page: you can select fonts; set the text size; and position copy where you like on screen, typing in text directly or reading it from wordprocessor files. Lines, borders and other graphic effects can be created, and pre-drawn graphics can be loaded onto the screen and positioned using cut and paste options. A snag here is that both programs turn text into graphics. In other words, once text has been positioned, there is no way of editing it other than deleting the incorrect section and starting again.

My favourite is *Pagemaker* (figure 1), which gives a very usable scrolling display of an A4 page, with roughly half a page on the screen at a time. With practice it is remarkably easy to enlarge, reduce, crop, stretch and rotate graphics and selected areas of the page.

Advanced Memory Systems, which sells *Pagemaker*, now does a set of utilities, pre-drawn graphics, and 27 new fonts under the name *Extra! Extra!* (for £24.95, reviewed in the February edition of *Acorn User*). This is highly recommended to all *Pagemaker* users, as it greatly increases the versatility of the basic package. Mirrorsoft does a similar add-on for *Fleet Street Editor* called *Admin Xtra*, and two sets of custom graphics: *Fonts 'n' Graphics* and the *Walt Disney Graphics Library* (all at £14.95 each).

Sources

As well as using pre-drawn graphics, *Pagemaker* and *Fleet Street Editor* can import graphics from a wide range of other sources. Favourite pictures from graphics software like AMX *Art* or *Super Art* are obvious candidates, while digitised video images grabbed from a camera, video recorder or TV set by the Watford Electronics BBC Video Digitiser can give some interesting results (figure 7). At £109, not everyone can afford one, and fortunately there are digitising services which can convert photographs or images on video into BBC format disc files for a more modest fee. Another way of capturing images is to use the Linear Graphics Plotmate A3M Plotter fitted with a Linscan upgrade. This can generate a mode 0 screen of any image by scanning it with a moving infra-red head mounted in place of the plotter's pen. The results are compatible with *Pagemaker* (figure 8).

Developments

The real drawback with both the desktop publishing programs for the BBC micro is that standard text has to be printed as a screen dump, so there is no way you can take advantage of any NLQ facility that your printer might have. The ideal would be the option of keeping your best letter quality for the bulk of the text, but to use all the graphics capabilities when needed. Fortunately there are two programs that go part of the way to achieving this goal, and another will soon be released that should fit the bill exactly.

Clares' *Artroom* and Ibbotson's *iMAGiN.A* programs both run on Master series machines, and allow graphic material to be printed in specific places on the page, while the latest offering from Ibbotson Design Software, called *iMAGiN.L*, and due for imminent release, will provide full control over mixing graphics and text output on a dot-matrix printer.

Essentially, *Artroom* lets you create graphics images and edit and manipulate digitised video images on a printed page. The paper has to be put through the printer twice – once to print the text (which can come from any wordprocessor or a font system such as *Fontwise+*) then a second time for graphics when *Artroom* can place graphics in pre-determined gaps left in the text. The procedure is rather fiddly, but it is a sensible low-cost way around the NLQ-plus-graphics problem.

Ibbotson's iMAGin.A takes a slightly different approach. The basic program is a graphics package with pull-down menus, but here the finished graphical sections are inserted automatically at the printout stage. The system lets you embed the names of graphics files in the text inside square brackets and they are sent to the printer at the appropriate time. It isn't possible to mix text and graphics on one printed line, but *iMAGiN.A* is perfect for producing reports with letter headings and diagrams, and would suit many people's needs.

The logical development of the ideas in *Artroom* and *iMAGiN.A* is *iMAGiN.L* ('iMAGes iN documents – Layout editor'),

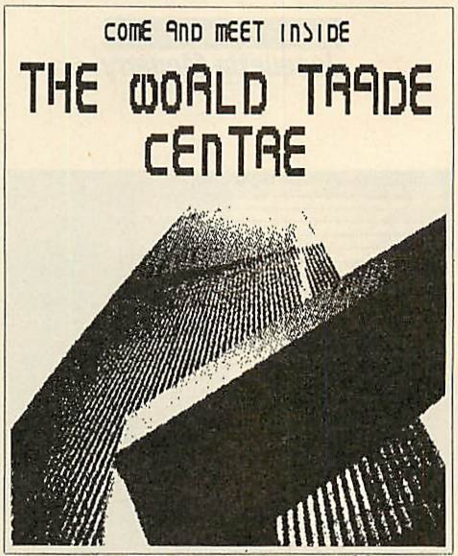


Figure 7. An AMX *Pagemaker* page with digitised images

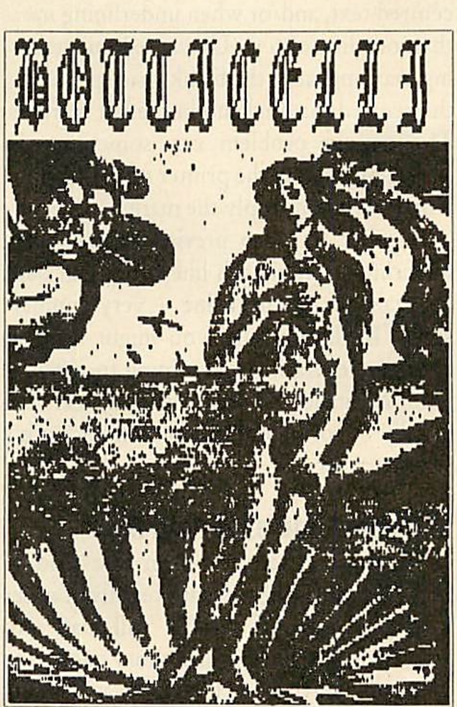


Figure 8. Images from Linear Graphics Linscan can be used with *Pagemaker*

which is nearly finished at the time of writing, and promises true desktop publishing functions by mixing text and graphics modes freely on one printed line. Text from the keyboard or wordprocessed ASCII files can be fed into pre-defined movable panels on screen, and the graphics can then be developed round these panels are inserted accordingly. The program offers WYSIWYG page layout and text editing in one package and is document-oriented, rather than page-oriented, so it sounds like the ideal solution: I can't wait to see the results. *iMAGiN.L* will run on the Master, and will cost £49.95 (the same as *iMAGiN.A*). Its graphics capabilities are apparently not as wide-ranging as something like AMX *Pagemaker*, so Ibbotson suggsts that *iMAGiN.A* should be used to develop any complex artwork needed by *iMAGiN.L*, giving an advanced DTP system on the BBC micro for £100.

Typesetting

If your printing needs are more exacting than the methods of publishing already mentioned, you might be tempted to have your BBC micro's wordprocessed files typeset for the last word in print quality. Nowadays this is feasible, as a number of firms offer electronic typesetting from BBC format discs for the production of manuals, books, leaflets, reports and so on.

It is important that the typesetter and customer work closely to get the required results, and a few sample pages are normally produced to make sure that layout, typeface, spacing, headings and so on are correct, before setting a whole book.

Another major typesetter dealing in BBC micro work is Quorum, which claims to be able to read files from over 700 different micros. They typeset many of Computer Concepts' manuals, and use a Linotron 202 phototypsetting machine for their quality work. They even produce a book to help prospective authors, called *Typesetting for Micro Users: A Beginner's Guide to Improved Text Presentation*. The book costs £9.50, and contains details of the simple but versatile ASPIC code system favoured by some typesetters today (it stands for 'author's symbolic pre-press interface code') which can be used to mark up copy before it is typeset.

Using this code system can reduce costs considerably, as the typesetter only has to set up a conversion table to interpret the codes correctly for the job in hand, and then take charge of the pagination. Quorum says that a set-up charge of around £60 is typical, then £3 to £4 per page for an average book with A5 pages. And that's about half the current cost of Linotron typesetting from Macintosh *Pagemaker* files.

WISDOM WITH WORDS

Make the most of your wordprocessing package by using the following advice

Jacquetta Megarry

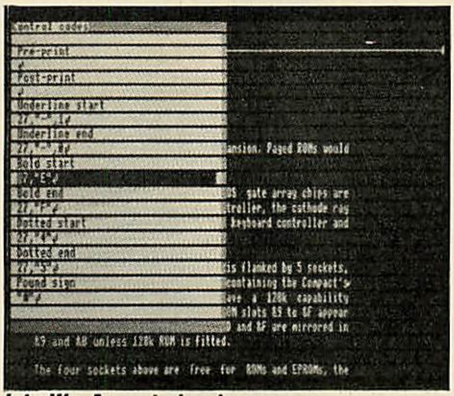
Printer control is such a persistent source of problems, we shall start this article with tips which should help users of any wordprocessing system. Then we look at the problem of exchanging files between different wordprocessors such as *View* and *Wordwise*. The rest of the article is devoted to tips on *InterWord*, Computer Concepts' popular 1986 release; there's a lot that the manual doesn't tell you!

Modern printers tend to have a buffer. This is a small chunk of memory which accepts data quickly from the computer and stores it until the printer has caught up. It can be useful if you are waiting to use the system while the printer produces a long document, but if you abort a printout (for example, by pressing Escape) it can be infuriating: leftover fragments may appear at the start of each fresh attempt, ruining the work.

One fix is to quickly switch the printer off and then on again, but this may have unwanted side-effects. A better solution is to dig out from the manual the command that clears the buffer; for *Wordwise +* with most current Epson-style printers put embedded command OC10 or OC24 in an empty segment and 'print' it. Once discovered, it may be worth programming the fix onto a suitable red function key in your standard !BOOT file (*AU* September, page 164 gives examples for *View* and *Wordwise*). *InterWord* users will find the 'post-print' sequence in the control codes' menu invaluable here: just enter 24 (or 10 or whatever) and the buffer will be cleared after each document automatically.

Problem underlines

Many combinations of wordprocessor with printer produce problems when underlining



***InterWord*'s control code menu**

centred text, and/or when underlining more than one line of text. Unwanted underscoring may appear in the blank space preceding the centred material and in the left margins. The margin problem can sometimes be solved by making the printer rather than the wordprocessor supply the margin.

Another fix is to preview, then switch underlining off at each line-break and back on again for the next line – very cumbersome. If all else fails, you might want to consider redefining underlining to produce bold or italic instead. Centred text can usually be sorted out by preceding it with a pad character.

Importing and exporting files

Users who exchange text on disc tend to find they need to cope with text from other wordprocessors. If the file will load into your own system it's usually easy enough to clean up stray characters such as ¦ using editing techniques like search-and-replace. More serious problems arise if you can't load the file in the first place.

It's impossible to cover all combinations, but the example quoted illustrates some important principles. I recently needed to integrate a highly formatted piece of *View* text into a *Wordwise* document. *View* files sometimes won't load directly, and even indirect methods are lengthy, especially when using a Master; the process was eased by using *InterWord* as a halfway house – version 1.02 (or later) seems capable of loading every type of file that I've tried. First, I entered *View* to un-justify the document (not vital, but it saved having to strip out extra spaces by hand later) and resaved to a new filename. Then I loaded my *Wordwise* document into *InterWord* (no problems here), positioned the cursor where I wanted the *View* text to appear, and used menu option four to merge it.

Now that the text was assembled, it only remained to strip out the spurious line breaks. First, I made screen codes visible (fourth option on preferences menu), then selected 'search and replace' with CTRL-f3. I searched for ¦ M (having found out the hard way that ¦ m doesn't work) and entered nothing under replace; leaving 'confirm changes' on (so as to retain the line-breaks between paragraphs and in tables), I had only to skip through pressing mostly Y and N only occasionally. In practice, I printed my final version from *InterWord*, but had I wished to return to *Wordwise*, it would have been a simple matter of loading it back, stripping out the unwanted block of rubbish at the beginning and end (using f3 and f7), and doing a menu option five search to replace ¦ with nothing (ie, press Return at the prompt).

The whole exercise was my first attempt and took around fifteen minutes including back-tracking and experimenting. I reckon two or three minutes next time – much quicker than retyping. Another way of loading *View* text into *InterWord* or *Wordwise* is to use Graham Bell's ASCII file spooler for *View* (*AU* July 1986), and

produce an unformatted text file. This can easily be read by other wordprocessors. Loading files into *View* is more difficult – *Wordwise* and *InterWord* files should generally be spooled first (menu option eight); say No to *InterWord*'s question 'with codes?' However, if a *Wordwise* file consists of plain text (no embedded commands), it may load into *View* as it is.

Recovering *Wordwise +*

Larry Richardson (*AU* July, page 47) drew attention to the problem of recovering *Wordwise* without switching the power off after running certain commercial software. It turns out that there is a universal solution to this after all. Computer Concepts pointed out that the published fix would work only with certain versions. Thanks to Gary Crawford of Crawley Down for providing the following method of helping *Wordwise +* to recover its private workspace when the system has 'hung'. First, press CTRL-Break to recover control of the keyboard. Now type:

```
*FX151, 78, 127
```

press Return then Break. Or use:

```
?&FE4E=&7F
```

in place of the *FX call. You will now be able to select any *Wordwise* system fitted with *W. as usual. The same fix works in reverse, allowing 'problem' software to run after *Wordwise* without switching off.

Margins and screen displays

Most people like to see as much of their document as possible displayed on screen, while wanting a left margin in the paper printout. Although you can write and edit a marginless document, inserting the margin just before printing, in *Interword* you can achieve the same effect or better without control codes. Select the printer set-up menu and set a column indent of eight spaces. This works even with printers which can't generate their own margins, and creates fewer problems with centred text.

InterWord printer effects

The screen displays three printer effects at any one time; initially they are defined as bold, underline and 'dotted' (Epson italic by default); you can combine any two or even all of these. It's easy to redefine their effects on printout using the control codes sub-menu (reached from the printer set-up menu), leaving their appearance unaltered.

Nevertheless, you are not restricted to *three styles* of printing in a document. To introduce an extra effect, position the cursor wherever you want it to begin and then press f1 for the embedded command menu; select control codes. Now type whatever code you want – for example 27,83,1 to select Epson-style subscript printing – and press Escape; repeat the process with 27,84 to switch it off. The only visible reminder that you have changed style is that the character with an embedded command will appear in inverse video. To remind yourself what that effect is, position the cursor over the character and press f1. To delete the command, position the cursor on it, press f1 – 'remove commands' is selected by default – and press Return (not Escape).

InterWord: to boot or not to boot

In an earlier feature (*AU* September, pages 164 to 165), I explained how booting a disc offers a short-cut for setting up standard preferences and documents. Unlike *View* and *Wordwise*, you can't prepare or edit a !BOOT file from within *InterWord* because *InterWord* saves gobbledegook at the head of each file which upsets the system when you try to autoboot. As it automatically saves your preferences, screen ruler and printer control codes with each document however, it's probably quicker to use a template approach, ie, keep an empty document on disc and load that as your first action each session. If you produce double-spaced documents you'll certainly need to store a template for that layout anyway. You can do this in a single action by entering *IWORD TEMPL (or *IW. TEMPL); hitting Return makes the system not only select *InterWord* but also load your template ready for action.

If that's too much bother to type, either shorten the template filename (eg, to T) or automate by setting up a !BOOT File, pressing Return after each line:

1) Select Basic with *BASIC (or *B.)
2) Enter *BUILD !BOOT
3) Enter *IWORD TEMPL after the figure 1 which appears automatically
4) Press Escape after the figure 2; the disc will spin, saving your file
5) Enter *OPT 4,3 (may not be needed if that disc already boots)
6) Test using Shift-Break

If you do decide that it's worth setting up a !BOOT file, you can include any other commands between steps three and four above. For example, you can define the red keys to produce useful strings just as in *View* and *Wordwise*. The command '*KEY0 Any old gobbledegook Return' can be entered from any *InterWord* menu to produce 'Any old gobbledegook' when you press f0 in menu mode or Shift-CTRL-f0 in edit mode (in any *InterWord* package). You can even use this trick to switch between packages quickly: add the following lines to your !BOOT file (or enter in menu mode); press Return after each:

```
*KEY0 *IW.0|M
*KEY0 *IW.1|M
```

In menu mode, simply press Shift-CTRL-f1 or Shift-CTRL-f0 to switch between *InterWord* packages zero and one.

InterWord: some quick tips

- Use the preferences menu to adjust the keyboard repeat rate and delay to suit your touch; I find that a rate of two and delay of 40 transforms my editing speed.
- If you're a fast typist or use short filenames, it may be quicker to ignore the disc menu display; just key in the filename after pressing one or two, as in *Wordwise*, and the file will be saved or loaded.
- If you are puzzled by mysterious spaces which can't be deleted, you may have pressed a red formatting key (f5, f6 or f7) by mistake. Press f4 to align left – or other key as appropriate – to restore the format you want. If that fails, select the preferences menu and make screen codes visible (fourth option) to help find stray Tabs.
- Defining headers and footers which include page numbers is cumbersome. The second printing of the Computer Concepts manual spells the process out in detail on page 98: note that if using the 'Footing = marked section' method you must press Return before placing the second marker. If you still don't get the footing you want, check the footer position (on the page layout menu) to make sure it lies within suitable limits for your page layout. If the footing is not quite right, edit it before losing the markers; unfortunately you can't edit headers and footers in *InterWord* – you have to redefine them.
- To move a marked section, you can resort the marked section menu (CTRL-f2) but it's quicker to use red keys f9 then f8 (Copy and Delete); make sure you press them in the right order!
- To highlight a single word use CTRL-Z to mark it, then press Shift-f4 to underline (or Shift-f5 for bold or whatever). To underline several words, mark them using f3 twice, but save time by marking the end before the beginning. Otherwise you'll have to move the cursor left one character to place it within the marked region before pressing Shift-f4; if you forget, the whole paragraph will be underlined, and when you press Shift-f7 to correct that, you'll lose any other underlines you may have set!

COMPETITION

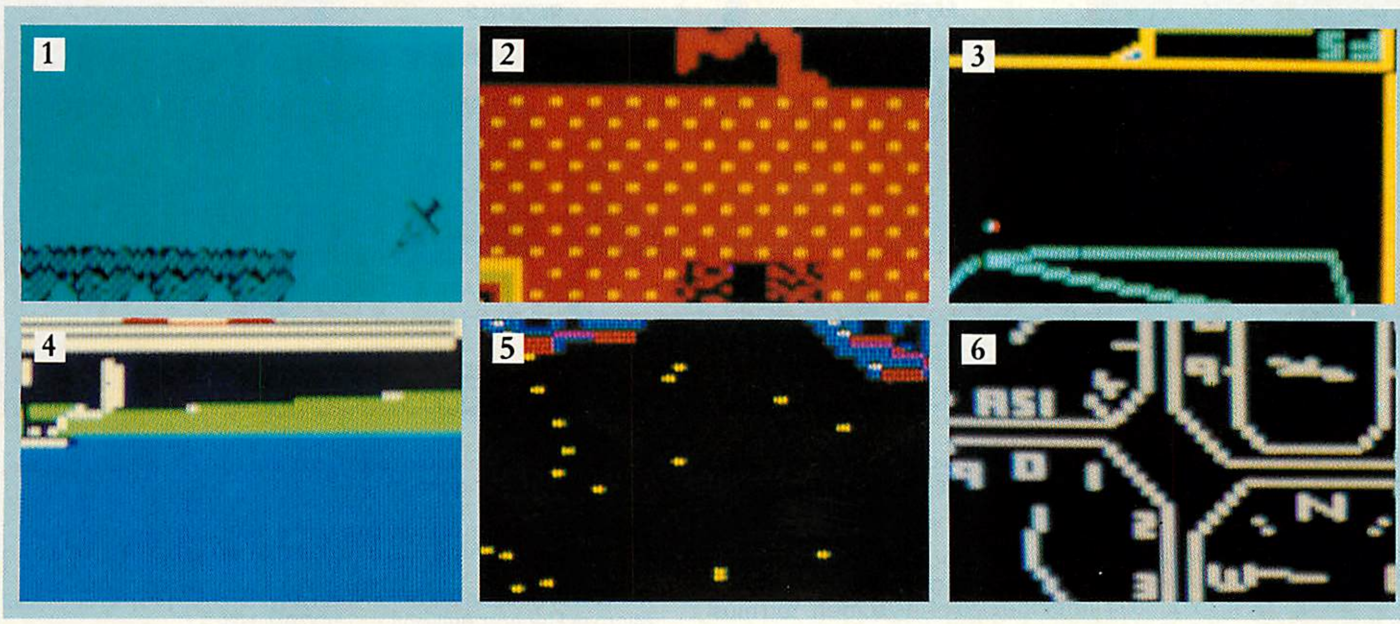
ON YOUR GUARD!

Twenty copies of Firebird's blockbuster game *Sentinel* to be won

David Lawrence



Sentinel: another winner from Crammond



Sentinel is the latest BBC micro game from award winning author Geoff Crammond. The game features 10,000 different 3D landscapes and smooth scrolling graphics. You play the part of a robot and must teleport around each level in an effort to absorb the evil sentinel who stands guard. A full review of the game can be found on page 139 of January's issue of *Acorn User*.

This month's problem is aimed at games players. Your task is to identify the six games pictured above. However, our photographer got things mixed up and only managed to fit a small detail of each screen into the picture! He also didn't photograph all the games we wanted. Above is the list we gave him; all you have to do is identify the six games shown in the photographs.

- Aviator
- Boffin
- Pole Position
- Sentinel
- Frak
- Revs
- Elite
- Repton 1
- Repton 2
- Phantom Combat
- Cylon Attack
- Cholo

Tell us which games correspond to the six numbered screens on the back of an envelope or postcard, please, to arrive not later than July 14, 1987. The first 20 correct entries pulled out of our hat after the closing date will win *Sentinel.*

Send your entry to June Competition, *Acorn User*, Redwood Publishing, 141-143 Drury Lane, London WC2B 5TF. Each entry must be accompanied by the coupon at the bottom of the page.

The Editor's decision is final.

ACORN USER
COMPETITION
JUNE

The Superior Collection
Volume 3

For the Acorn Electron

NEW RELEASE

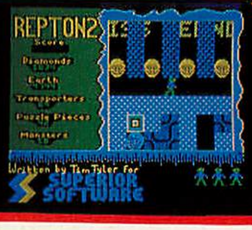


SYNCRON

Voted COMPUTER GAMER'S BBC MICRO GAME OF THE YEAR 1985



REPTON



REPTON 2



KARATE COMBAT



DEATHSTAR



MR. WIZ



SMASH AND GRAB



OVERDRIVE

A New Concept in Compilations

The Superior Collection Volume 3 features one brand new game, Syncron, together with 7 of Superior Software's classic hits for the Acorn Electron.

Syncron is a fast-action game set against a backdrop of an enormous graphically-detailed scrolling landscape.
The landscape is, in total, 1024 times the size of the screen. You must endeavour to complete 16 hair-raising missions; in each mission you have to collect a number of power cylinders, land your spacecraft on a runway with each cylinder in turn, and finally locate and bomb the HQ Building. Whilst skilfully manoeuvring your spacecraft between the defence pylons and force-fields, you are attacked by alien spacecraft and missiles launched from the land bases.
A superb game, worth at least £7.95 in its own right.

Acorn Electron dual cassette	£9.95
Acorn Electron 3½" disc	£14.95

Here's what the computer press said about some of the other titles on this compilation package:—

REPTON: "This is an astounding game reaching new heights in Electron arcade adventures." . . . ELECTRON USER

REPTON 2: "Repton 2 is better than anything I've played on the BBC Micro or Electron. Brilliant!" . . . ACORN USER

DEATHSTAR: "Deathstar is a super fast, all action arcade classic. It's the sort of game that you can't put down . . . The graphics are excellent and the scrolling is very smooth in all four directions. The pace is fast and furious even on the starting screen. This action packed game is recommended for all arcade gamers."
. . . ELECTRON USER

SMASH AND GRAB: "As usual with Superior products the graphics are excellent, with a good use of colour and no flicker. I expect this game will have you rolling with laughter. I certainly did.

Instructions	95%	
Playability	95%	Awarded
Graphics	100%	★★★★★
Value For Money	100%	(Top Rating)"

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YELLOW PAGES

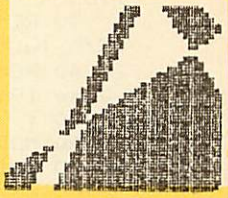
INDEX/COMPATIBILITY

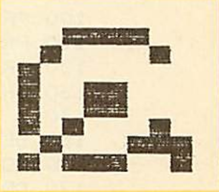
Entering listings

To make the task of entering listings easier, *Acorn User* has adopted several standards in the Yellow Pages. Programs are listed with line numbers in increments of 10, so type AUTO <Return> for automatic line numbering before you start. Before you list what you've entered, type LISTO 1 <Return> to provide spaces after the line numbers. Programs in the Yellow Pages are often listed to a width of 40 characters, so type MODE 6 <Return> before you start. Comparing the line-endings of your listing with the Yellow Pages will help you spot extra or missing characters.

To make sure that the program you want to enter will work on your particular machine, check the index below. All the listings work with Basic 1,2 and 4 (unless stated otherwise) and with operating systems OS1.2 or above. If a program is accompanied by an article, please read the article first. If special care is needed when entering, we provide an easy-to-complete 'How To Enter' box.

Once you've typed in your program, save it to tape or disc then test it by running it. If you have a major problem with a listing, ask someone to check it. If you still have difficulties, you can also send off for a list of *Checksums* which help you find the errors. Send a large sae (26p stamp) to *AU*Checksums, PO Box 641, London NW9 8TF.







DISCS AND TAPES



All the listings on these pages can be found on this month's listings disc or cassette. See page 109 for details.

BACK ISSUES





For help with entering and debugging listings see the following back issues: April '86, June '85, Aug '84, Sept '83.

Program	Page	BBC B	B+/128	Master 128	Master Compact	Electron	6502SP/ Turbo	ADFS	Econet	Shadow RAM	On Monthly Tape and Disc
Hints & Tips											
Listing 1	114	■	■	■	■	■1	■	■	■	■	■
Listing 2-3	115	■	■	■	■	■	■	■	■	■	■
Listing 4	115	■	■	■	■	■1	■	■	■	■	■
Listing 5-6	115	■	■	■	■	■	■	■	■	■	■
Acorn Forum											
Listing 1	116	■	■	■	■	■	■	■	■	■	■
Listing 2-3	116	■	■	■	■		■	■	■	■	■
Listing 4	116	■	■	■	■	■	■	■	■	■	■
Listing 5				■	■			■	■	■	■
Joe's Jottings											
Joevdu	117	■2	■2	■	■		■	■	■3	■	■
Joetop/Calc	117/124	■2	■2	■	■		■	■	■3	■	■
Iconmaker/Starmaker	125/126	■2	■2	■	■		■	■	■3	■	■
Filemaker/Bstamp	126/128	■2	■2	■	■		■	■	■3	■	■
Top of the List											
Mouseread	128	■4	■4	■4				■	■	■	■

Notes 1. Requires Plus 1 2. Requires 6502 second processor and ADFS 3. Doesn't work fully with Econet 4. Requires AMX Mouse

See Hints & Tips, page 43

Listing 1. Partial screen dump, mode 1

```
   10 REM Hints & Tips - listing 1
   20 REM by Martin Phillips
   30 REM for BBC B/B+/M/C/E (with plus 1)
   40 REM (c) Acorn User June 1987
   50 :
   60 MODE 1
   70 xmin=400:ymin=200
   80 xmax=720:ymax=900
   90 PROCassemble
  100 PROCcheck
  110 PROCtriangles
  120 PROCrun
  130 END
  140 :
  150 DEF PROCrun
  160 MOVE xmin,ymin
  170 DRAW xmax-4,ymin
  180 DRAW xmax-4,ymax-4
  190 DRAW xmin,ymax-4
  200 DRAW xmin,ymin
  210 !&80=xmin:!&82=ymin
  220 !&84=xmax:!&86=ymax
  230 CALL &900
  240 ENDPROC
  250 :
  260 DEF PROCtriangles
  270 CLS
  280 VDU 19,0,7,0,0,0
  290 VDU 19,3,0,0,0,0
  300 GCOL 4,3
  310 FOR N%=1 TO 10
  320 MOVE RND(1500),RND(1500)
  330 MOVE RND(1500),RND(1500)
  340 PLOT 85,RND(1500),RND(1500)
  350 NEXT N%
  360 GCOL 0,1
  370 ENDPROC
  380 :
  390 DEF PROCcheck
  400 total%=0:target%=26767
  410 FOR byte%=&900 TO &9E7
  420 total%=total%+?byte%
  430 NEXT byte%
  440 IF total%<>target% THEN PRINT"Checksum error - please check listing":END
  450 ENDPROC
  460 :
  470 DEF PROCassemble
  480 xlo=&70:xhi=&71
  490 ylo=&72:yhi=&73
  500 pixel=&74:byte=&75
  510 bitcount=&76
  520 oswrch=&FFEE
  530 osword=&FFF1
  540 FOR pass=0 TO 2 STEP 2
  550 P%=&900
  560 [OPT pass
  570 :
  580 .start
  590 LSR &82
  600 ASL &82
  610 LSR &86
  620 ASL &86
  630 SEC
  640 LDA &86
  650 SBC &82
  660 STA &88
  670 LDA &87
  680 SBC &83
  690 STA &89
  700 LSR &88
  710 CLC
  720 LSR &89
  730 BCC setx
  740 LDA &88
  750 ADC #127
  760 STA &88
  770 .setx
  780 LDA &80
  790 STA xlo
  800 LDA &81
  810 STA xhi
  820 :
  830 .setprinter
  840 LDA #2
  850 JSR oswrch
  860 LDA #10
  870 JSR printer
  880 LDA #27
  890 JSR printer
  900 LDA #65
  910 JSR printer
  920 LDA #8
  930 JSR printer
  940 :
  950 .newline
  960 LDA &82
  970 STA ylo
  980 LDA &83
  990 STA yhi
 1000 LDA #27
 1010 JSR printer
 1020 LDA #42
 1030 JSR printer
 1040 LDA #5
 1050 JSR printer
 1060 LDA &88
 1070 JSR printer
 1080 LDA &89
 1090 JSR printer
 1100 :
 1110 .newcolumn
 1120 LDA #8
 1130 STA bitcount
 1140 :
 1150 .readpixel
 1160 LDX #xlo
 1170 LDY #0
 1180 LDA #9
 1190 JSR osword
 1200 CLC
 1210 LDA pixel
 1220 BEQ setbyte
 1230 SEC
 1240 :
 1250 .setbyte
 1260 ROL byte
 1270 LDA xlo
 1280 CLC
 1290 ADC #2
 1300 STA xlo
 1310 BCC columnend
 1320 INC xhi
 1330 :
 1340 .columnend
 1350 DEC bitcount
 1360 LDA bitcount
 1370 BNE readpixel
 1380 LDA byte
 1390 JSR printer
 1400 CLC
 1410 LDA #2
 1420 ADC ylo
 1430 STA ylo
 1440 BCC lineend
 1450 INC yhi
 1460 :
 1470 .lineend
 1480 LDA &86
 1490 CMP ylo
 1500 BNE line
 1510 LDA &87
 1520 CMP yhi
 1530 BEQ endline
 1540 :
 1550 .line
 1560 LDA xlo
 1570 SEC
 1580 SBC #16
 1590 STA xlo
 1600 BCS newcolumn
 1610 DEC xhi
 1620 BCC newcolumn
 1630 :
 1640 .endline
 1650 LDA #10
 1660 JSR printer
 1670 :
 1680 .checkend
 1690 LDA &85
 1700 CMP xhi
 1710 BNE new
 1720 CLC
 1730 LDA &84
 1740 SBC xlo
 1750 BCC end
 1760 :
 1770 .new
 1780 JMP newline
 1790 :
 1800 .end
 1810 LDA #10
 1820 JSR printer
 1830 LDA #27
 1840 JSR printer
 1850 LDA #64
 1860 JSR printer
 1870 LDA #3
 1880 JSR oswrch
 1890 RTS
 1900 :
 1910 .printer
 1920 PHA
 1930 LDA #1
 1940 JSR oswrch
 1950 PLA
 1960 JSR oswrch
 1970 RTS
 1980 ]
 1990 NEXT pass
 2000 ENDPROC
```

Listing 2. Graphics window demonstration

```
   10 REM Hints & Tips - listing 2
   20 REM by Martin Phillips
   30 REM for BBC B/B+/M/C/E
   40 REM (c) Acorn User June 1987
   50 :
   60 MODE 6
   70 INPUT "Enter mode "M%
   80 PRINT "Enter graphics window coord
inates:"
   90 INPUT "X min "xmin
  100 INPUT "Y min "ymin
  110 INPUT "X max "xmax
  120 INPUT "Y max "ymax
  130 MODE M%
  140 VDU 24,xmin;ymin;xmax;ymax;
  150 MOVE xmin,ymin:DRAW xmax,ymin
  160 DRAW xmax,ymax:DRAW xmin,ymax
  170 DRAW xmin,ymin
  180 A%=174:X%=0:Y%=255
  190 result=USR(&FFF4)
  200 V%=(result AND &FFFF00) DIV 256
  210 v%=16/(1+V%?&61)
  220 PRINT "VDU variables start locatio
n = &";~V%
  230 IF v%=16 THEN PRINT "Not a graphic
s mode":END
  240 PRINT "X scale factor = ";v%
  250 PRINT "X min = ";(V%?0+(V%?1)*256)
*v%
  260 PRINT "Y min = ";(V%?2+(V%?3)*256)
*4
  270 PRINT "X max = ";(V%?4+(V%?5)*256)
*v%
  280 PRINT "Y max = ";(V%?6+(V%?7)*256)
*4
```

Listing 3. Colour fill routine

```
   10 REM Hints & Tips - listing 3
   20 REM by Nathan King
   30 REM for BBC B/B+/M/C/E
   40 REM (c) Acorn User June 1987
   50 :
   60 MODE 2:step=8
   70 MOVE 400,100:DRAW 200,500
   80 DRAW 500,500:DRAW 600,500
   90 DRAW 400,100
  100 PROCfill(400,110,500,1)
  110 END
  120 :
  130 DEF PROCfill(X,Y,hi,col%)
  140 VDU 5
  150 GCOL 0,col%
  160 REPEAT
  170 FOR N%=-step TO step STEP 2*step
  180 Y=Y+4:MOVE X,Y
  190 REPEAT
  200 DRAW X,Y
  210 X=X+N%
  220 UNTIL POINT(X,Y)=7
  230 NEXT N%
  240 UNTIL Y>=hi
  250 ENDPROC
```

Listing 4. Enlarged condensed mode 0 for Copal

```
   10 REM Hints & Tips - listing 4
   20 REM By Colin Attenborough
   30 REM For BBC B/B+/M/C/E (with plus
 1)
```

Continued ►

◄ Hints & Tips listing 4 continued

```
   40 REM (c) Acorn User July 1987
   50 :
   60 wrchv=&20E
   70 buff=&9A0
   80 ovec=&9B0
   90 FOR pass%=0 TO 2 STEP 2
  100 P%=&900
  110 [OPT pass%
  120 LDA wrchv
  130 STA ovec
  140 LDA wrchv+1
  150 STA ovec+1
  160 LDA #start MOD 256
  170 STA wrchv
  180 LDA #start DIV 256
  190 STA wrchv+1
  200 RTS
  210 :
  220 .start
  230 PHP
  240 STA buff
  250 CMP #13
  260 BNE exit
  270 LDA #1
  280 JSR write
  290 LDA #15
  300 JSR write
  310 LDA #1
  320 JSR write
  330 LDA #14
  340 JSR write
  350 :
  360 .exit
  370 LDA buff
  380 PLP
  390 .write
  400 JMP (ovec)
  410 ]
  420 NEXT
```

Listing 5. True or false

```
   10 REM Listing 5
   20 PROCask("Do you understand")
   30 IF yes THEN PRINT "Good"
   40 PROCask("Shall we do it again?")
   50 IF no THEN END ELSE RUN
   60 :
   70 DEF PROCask(A$)
   80 LOCAL A%
   90 PRINT'A$;" (Y/N) ";
  100 REPEAT
  110 A%=(GET AND &DF)
  120 yes=(A%=89)
  130 no=(A%=78)
  140 UNTIL yes OR no
  150 ENDPROC
```

Listing 6. Spooling graphics

```
   10 REM Listing 6
   20 *SPOOL LINES
   30 MODE 0
   40 VDU 19,0,4,0,0,0
   50 FOR L%=1 TO 100
   60 DRAW RND(1300),RND(1100)
   70 NEXT L%
   80 *SPOOL
```

See Acorn Forum, page 53

Listing 1. Demo of local quirk

```
10 REM Demo of LOCAL quirk
20 REM by Dave Instone
30 REM For B/B+/E/M/C
40 REM (c) Acorn User Jun 87
50 :
60 Z% = 5
70 PRINT "main - Z = ";Z%
80 PROCa
90 PRINT "main - Z = ";Z%
100 PROCb
110 PRINT "main - Z = ";Z%
120 END
130 :
140 DEF PROCb
150 LOCAL Z%
160 Z% = 10
170 PRINT "PROCa - Z = ";Z%
180 PROCa
190 PRINT "PROCa - Z = ";Z%
200 ENDPROC
210 :
220 DEF PROCa
230 PRINT "PROCb - Z = ";Z%
240 ENDPROC
```

Listing 2. Teletext character plotting

```
10 REM Teletext Character Plotting
20 REM by S Krasnoshchiokov
30 REM for B/B+/M/C
40 REM (c) Acorn User Jun 87
50 :
60 MODE 7
70 VDU 23,1,0;0;0;0;
80 DIM grid%(9,8)
90 PROCteletext ("AcornUser",6,3)
100 VDU 31,0,24
110 END
120 :
130 DEFPROCteletext (text$,line%,colou
r%)
140 FOR I%=1 TO 3
150 PRINT TAB(0,line%+I%-1);CHR$(154);
CHR$(144+colour%);
160 NEXT
170 PRINT TAB(2,line%);
180 FOR K%=1 TO LEN(text$)
190 ?&70=ASC(MID$(text$,K%,1))
200 A%=10
210 X%=&70
220 Y%=0
230 CALL &FFF1
240 ?&79=0
250 FOR I%=1 TO 9
260 FOR J%=1 TO 8
270 IF (I%?&70 AND 2^(8-J%))<>0 THEN g
rid%(I%,J%)=1 ELSE grid%(I%,J%)=0
280 NEXT
290 NEXT
300 FOR I%=1 TO 3
310 FOR J%=1 TO 4
320 VDU grid%(3*I%-2,2*J%-1)+2*grid%(3
*I%-2,2*J%)+4*grid%(3*I%-1,2*J%-1)+8*gri
d%(3*I%-1,2*J%)+16*grid%(3*I%,2*J%-1)+64
*grid%(3*I%,2*J%)+160
330 NEXT
340 VDU 10,8,8,8,8
350 NEXT
360 VDU 11,11,11,9,9,9,9
370 NEXT
380 ENDPROC
```

Listing 3. AMX fonts

```
10 REM AMX Fonts
20 REM by Phil Wilkes
30 REM For B/B+/M/C
40 REM (c) Acorn User Jun 87
50 :
60 MODE 7
70 HIMEM=&5000
80 PRINT "PAGEMAKER to SUPERART Font
Transfer"
90 PRINT STRING$(35,CHR$ 95)
100 PROCs ("SUPERART")
110 *LOAD F.GOUDA 5000
120 PROCs ("PAGEMAKER")
130 CLS
140 *CAT
150 INPUT "Font name : " f$
160 PROCos ("LOAD "+f$+" 5FFA")
170 PROCs ("SUPERART")
180 C%=OPENOUT f$
190 FOR L%=0 TO 31
200 BPUT# C%,?(&5000+L%)
210 NEXT
220 FOR L%=0 TO 90
230 FOR A%=0 TO 1
240 FOR B%=0 TO 15
250 BPUT# C%,?(&6020+B%*2+A%+L%*32)
260 NEXT B%
270 NEXT A%
280 NEXT L%
290 FOR L%=0 TO 127
300 BPUT# C%,?(&5000+92*32+L%)
310 NEXT
320 CLOSE# C%
330 END
340 :
350 DEF PROCs(a$)
360 PRINT
370 PRINT"Insert "+a$+" Font disc and"
380 PRINT"then press SPACE"
390 *FX15
400 REPEATUNTILGET=32
410 ENDPROC
420 :
430 DEF PROCos($&700)
440 LOCAL X%,Y%
450 X%=0 : Y%=7
460 CALL &FFF7
470 ENDPROC
```

Listing 4. Tree of Pythagoras

```
10 REM Tree of Pythagoras
20 REM by P G McTiernan
30 REM for BBC B/B+/M/C/E
40 REM (c) Acorn User June 1987
50 :
60 MODE 4
70 RESTORE 350
80 FOR N% = 1 TO 2
90 READ M%,L%,H%,delta,a
100 CLS
110 a=RAD(a)
120 s2=SIN(a)*SIN(a)
130 sc=SIN(a)*COS(a)
140 PROCtree(M%-L%,H%,M%+L%,H%)
150 REPEAT UNTIL GET
160 NEXT
170 END
180 :
190 DEF PROCtree(x1,y1,x2,y2)
```

Continued ►

JOE'S JOTTINGS

◄ Tree of Pythagoras continued

```
200 LOCAL x3,x4,x5,y3,y4,y5,l,dx,dy
210 dx=x2-x1:dy=y2-y1
220 l=SQR(dx*dx+dy*dy)
230 x4=x1-dy:x3=x2-dy
240 y4=y1+dx:y3=y2+dx
250 x5=x4+dx*s2-dy*sc
260 y5=y4+dy*s2+dx*sc
270 MOVE x4,y4
280 DRAW x1,y1:DRAW x2,y2
290 DRAW x3,y3: DRAWx4,y4
300 IF l<=delta THEN ENDPROC
310 PROCtree (x4,y4,x5,y5)
320 PROCtree (x5,y5,x3,y3)
330 ENDPROC
340 :
350 DATA 640,110,0,10,45
360 DATA 375,90,150,15,30
```

See Set 'em up Joe, page 81

Listing 1. *JOE* loader program

```
 10 REM J.O.E. Loader
 20 REM By Joe Telford
 30 REM For BBC Master Series
 40 REM (c) Acorn User June 1987
 50 :
 60 VDU23,128,0,0,0,0,192,48,12,3
 70 VDU23,129,255,252,252,195,0,0,0,0
 80 VDU23,130,129,195,231,255,255,231,
195,129
 90 VDU23,131,24,24,60,60,126,126,255,
255
 100 VDU23,132,255,255,126,126,60,60,24
,24
 110 VDU23,133,0,0,255,128,128,128,128,
128
 120 VDU23,134,0,0,255,0,0,0,0,0
 130 VDU23,135,0,0,255,1,1,1,1,1
 140 VDU23,136,128,128,128,128,128,128,
128,128
 150 VDU23,137,1,1,1,1,1,1,1,1
 160 VDU23,138,128,128,128,128,128,128,
255,0
 170 VDU23,139,0,0,0,0,0,0,255,0
 180 VDU23,140,1,1,1,1,1,1,255,0
 190 VDU23,141,0,15,24,48,48,24,15,0
 200 VDU23,142,0,240,24,12,12,24,240,0
 210 VDU23,143,128,240,24,12,12,24,240,
128
 220 VDU23,144,0,0,255,60,0,0,0,0
 230 VDU23,145,0,0,0,0,0,60,255,0
 240 VDU23,146,0,0,255,97,81,73,69,127
 250 VDU23,147,0,0,0,0,0,1,1,31
 260 VDU23,148,0,0,0,0,0,128,128,255
 270 VDU23,149,0,0,0,0,0,0,0,255
 280 VDU23,150,0,0,0,0,0,255,0,0
 290 VDU23,151,16,16,16,16,16,16,16,16
 300 VDU23,152,0,0,0,0,0,0,0,240
 310 VDU23,153,16,16,255,1,1,1,1,1
 320 VDU23,154,16,16,16,16,8,4,3,0
 330 VDU23,155,3,12,120,216,216,192,96,
63
 340 VDU23,156,248,6,3,3,3,3,6,254
 350 VDU23,157,255,0,255,0,255,0,255,0
 360 VDU23,158,255,192,192,192,224,224,
248,252
 370 VDU23,159,255,3,3,3,7,7,31,63
 380 VDU23,160,252,248,224,224,192,192,
192,255
 390 VDU23,161,63,31,7,7,3,3,3,255
 400 VDU23,162,0,0,255,1,1,15,8,15
```

Continued ►

◄ *JOE* loader continued

```
 410 VDU23,163,3,3,3,3,3,0,255,0
 420 VDU23,164,192,192,192,192,192,0,25
5,0
 430 VDU23,165,0,0,255,128,128,128,255,
128
 440 VDU23,166,0,0,255,129,129,129,255,
129
 450 VDU23,167,128,128,255,128,128,128,
255,128
 460 VDU23,168,129,129,255,129,129,129,
255,129
 470 VDU23,169,128,128,255,128,128,128,
255,0
 480 VDU23,170,129,129,255,129,129,129,
255,0
 490 MODE 128:CHAIN"JOETOP"
```

Listing 2. *JOE* front-end

```
 10 REM GEM-like front end
 20 REM By Joe Telford
 30 REM For BBC Master Series
 40 REM (c) Acorn User 1987
 50 :
 60 A%=135:IF ((USR(&FFF4) AND &FF0000
)DIV&10000)>0 THEN MODE 128
 70 PROCsetup
 80 ON ERROR PROCerr
 90 *CLOSE
 100 REPEAT:PROCptrloop
 110 IF f%=0 AND py%>500 c%=0
 120 IF f%=0 AND py%<=500 c%=1
 130 PROCclick:PROCdo
 140 UNTIL FALSE
 150 :
 160 DEF PROCptrloop
 170 VDU5:GCOL4,0:MOVEpx%,py%:PRINTc$
 180 REPEAT:PROCmoveptr:UNTILINKEY-74
 190 PROCclick:MOVEpx%,py%:PRINTc$:VDU4
 200 ENDPROC
 210 :
 220 DEF PROCmoveptr:MOVE px%,py%:GCOL4
,0
 230 gap%=8:IF INKEY-1 gap%=32
 240 IF INKEY-58 AND (py%+gap%)<=1023 P
RINT c$:py%=py%+gap%:MOVE px%,py%:PRINT
c$:MOVE px%,py%
 250 IF INKEY-42 AND (py%-gap%)>=32 PRI
NT c$:py%=py%-gap%:MOVE px%,py%:PRINT c$
:MOVE px%,py%
 260 IF INKEY-122 AND (px%+gap%)<=1248
PRINT c$:px%=px%+gap%:MOVE px%,py%:PRINT
 c$:MOVE px%,py%
 270 IF INKEY-26 AND (px%-gap%)>0 PRINT
 c$:px%=px%-gap%:MOVE px%,py%:PRINT c$:M
OVE px%,py%
 280 IF INKEY-56 THEN *SDUMP+
 290 IF ck%=1 PROCclock
 300 ENDPROC
 310 :
 320 DEF PROCclick:SOUND0,-15*vol,2,1:E
NDPROC
 330 :
 340 DEF PROCdo
 350 IF FNtopline ENDPROC
 360 IF FNfullscr ENDPROC
 370 IF FNclose ENDPROC
 380 IF FNsu ENDPROC
 390 IF FNsd ENDPROC
 400 IF FNcscr=0 ENDPROC
```

Continued ►

◀ *JOE* front-end continued

```
 410 REPEAT UNTIL INKEY$(5)="":A=GET
 420 IF A=13 THEN PROCclick:PROCreadnex
t:ENDPROC
 430 IF A=127 PROCdob:PROCdesk:ENDPROC
 440 IF A=135 THEN c$=copy$:PROCcob:PRO
Cdesk:c$=pointer$:ENDPROC
 450 PROCtsk:ENDPROC
 460 :
 470 DEF FNtopline
 480 IF py%<988 THEN =0
 490 IF px%<144 THEN PROCam:PROCdesk:=-
1
 500 IF px%>=1200 THEN PROCcopyright:PR
OCdesk:=-1
 510 IF px%>=900 AND px%<1100 THEN ck%=
0:PROCclock:OSCLI("DIR "+jfolder$):CHAIN
"CALC":PROCdesk:=-1
 520 IF px%>=400 AND px%<=500 ck%=1-ck%
:PROCclock:=-1 ELSE =0
 530 :
 540 DEF FNfullscr
 550 IF px%<1224 THEN =0
 560 IF py%>=932 AND py%<=964 THEN f%=1
-f%:PROCdesk:=-1
 570 IF py%>=440 AND py%<=480 AND f%=0
THEN f%=1-f%:PROCdesk:=-1
 580 =0
 590 :
 600 DEF FNclose
 610 IF px%>32 THEN =0
 620 IF py%>=932 AND py%<=964 THEN PROC
shut(c%):=-1
 630 IF py%>=440 AND py%<=480 AND f%=0
THEN PROCshut(1):=-1 ELSE =0
 640 :
 650 DEF PROCshut(w)
 660 LOCAL p,pflag
 670 IF L%(w)=0 ENDPROC
 680 IF ABS(L%(w))=1 pa$(w)="Desktop "+
STR$(w):L%(w)=0:PROCpc(w,f%,0):ENDPROC
 690 p=0:REPEAT p=p+1:IF MID$(pa$(w),p,
1)="." THEN pflag=p
 700 UNTIL p=LEN(pa$(w))
 710 pa$(w)=LEFT$(pa$(w),pflag-1)
 720 PROCget(pa$(w),w)
 730 L%(w)=L%(w)-1
 740 PROCpc(c%,f%,L%(w))
 750 ENDPROC
 760 :
 770 DEF FNsd
 780 IF px%<1224 THEN =0
 790 IF L%(c%)<1 THEN =0
 800 IF f%=1 AND py%>=848 AND py%<=916
THEN sc%(c%)=0:=-1
 810 IF py%>=848 AND py%<=916 THEN PROC
dosu:=-1
 820 IF py%>=368 AND py%<=436 AND f%=0
THEN PROCdosu:=-1
 830 =0
 840 :
 850 DEF PROCdosd
 860 IF sc%(c%)=3 ENDPROC
 870 sc%(c%)=sc%(c%)+1
 880 PROCpc(c%,f%,L%(c%))
 890 ENDPROC
 900 :
 910 DEF FNsu
 920 IF px%<1224 THEN =0
 930 IF L%(c%)<1 THEN =0
 940 IF f%=1 AND py%>=32 AND py%<=80 TH
EN sc%(c%)=0:=-1
 950 IF py%>=32 AND py%<=80 THEN PROCdo
sd:=-1
```

Continued ▶

◀ *JOE* front-end continued

```
 960 IF py%>=488 AND py%<=556 AND f%=0
THEN PROCdosd:=-1
 970 =0
 980 :
 990 DEF PROCdosu
1000 IF sc%(c%)=0 ENDPROC
1010 sc%(c%)=sc%(c%)-1
1020 PROCpc(c%,f%,L%(c%))
1030 ENDPROC
1040 :
1050 DEF PROCclock:VDU4:PRINTTAB(25,0);
1060 IF ck%=1 PRINTTIME$ ELSE PRINT"Clo
ck"+STRING$(20," ")
1070 VDU5:ENDPROC
1080 :
1090 DEF FNcscr
1100 IF px%<16 THEN =0
1110 IF px%>1247 THEN =0
1120 IF py%>920 THEN =0
1130 IF py%<60 THEN =0
1140 IF f%=0 AND py%<548 AND py%>440 TH
EN =0
1150 xc%=(px%-16)DIV176
1160 IF f%=1 THEN yc%=6-(py%-28)DIV 128
1170 IF f%=0 AND c%=0 yc%=2-(py%-540)DI
V 128
1180 IF f%=0 AND c%=1 yc%=2-(py%-60)DIV
128
1190 ch%(c%)=sc%(c%)*14+xc%+yc%*7
1200 IF ch%(c%)>it%(c%) THEN =0
1210 PROCtsk:=1
1220 :
1230 DEF PROCtsk
1240 IF f%=1 PROCr(xc%*176+16,(6-yc%)*1
28+28,160,128,1)
1250 IF f%=0 AND c%=0 PROCr(xc%*176+16,
(2-yc%)*128+540,160,128,1)
1260 IF f%=0 AND c%=1 PROCr(xc%*176+16,
(2-yc%)*128+60,160,128,1)
1270 ENDPROC
1280 :
1290 DEF PROCreadnext
1300 IF L%(c%)=0 THEN PROCstartdisc:END
PROC
1310 IF L%(c%)>0 OR L%(c%)<0 PROCgo
1320 ENDPROC
1330 :
1340 DEF PROCstartdisc
1350 IF ip$(ch%(c%),1)="ROMS" pa$(c%)="
Sideways ROMS":L%(c%)=-1:PROCreadroms:PR
OCpc(c%,f%,-1):ENDPROC
1360 pa$(c%)=ip$(ch%(c%),1):PROCrfs(pa$
(c%)):ENDPROC
1370 :
1380 DEF PROCdob
1390 LOCAL files,ch
1400 IF L%(c%)<0 PROCdelrom:ENDPROC
1410 IF L%(c%)<1 PROCok("Can't DELETE f
rom desktop!"):ENDPROC
1420 fb$=fn$(c%,ch%(c%))
1430 ab$=LEFT$(fa$(c%,ch%(c%)),3)
1440 IF fb$="New Folder" PROCok("Can't
delete New Folders!"):ENDPROC
1450 IF ab$="DIR" THEN type$=" FOLDER :
" ELSE type$=" FILE : "
1460 IF FNC(" CONFIRM "," CANCEL ","DEL
ETE"+type$+fb$)=0 THEN ENDPROC
1470 PROCget(pa$(c%),c%)
1480 files=0:*CLOSE
1490 IF ab$="DIR" ch=OPENIN(fb$):PTR#ch
=5:files=BGET#ch:CLOSE#ch
1500 IF files>0 PROCok("Please delete f
iles inside folder!"):ENDPROC
```

Continued ▶

◀ *JOE* front-end continued

```
 1510 IF ab$<>"DIR" OR (files=0 AND ab$=
"DIR") PROCh:OSCLI("ACCESS "+fb$+ " WR")
:OSCLI("DELETE "+fb$)
 1520 IF ab$="DIR" AND INSTR(pa$(1-c%),(
pa$(c%)+"."+fb$))>0 THEN pa$(1-c%)=pa$(c
%):L%(1-c%)=L%(c%)
 1530 IF L%(1-c%)>0:PROCget(pa$(1-c%),1-
c%)
 1540 PROCget(pa$(c%),c%)
 1550 ENDPROC
 1560 :
 1570 DEF PROCdesk
 1580 IF f%=1 sc%(c%)=0
 1590 COLOUR 129:VDU 26,12,4:COLOUR 0:GC
OL 0,0
 1600 PRINT TAB(0,0);" Actions";TAB(25,0
)"Clock";TAB(58,0);"Calculator";TAB(76,0
);"JOE";
 1610 MOVE 0,980:DRAW1279,980
 1620 IF f%=1 PROCdisp(1,1,78,29,c%):END
PROC
 1630 IF f%=0 PROCdisp(1,16,78,14,0):PRO
Cdisp(1,1,78,14,1)
 1640 ENDPROC
 1650 :
 1660 DEF PROCcob
 1670 LOCAL loop%
 1680 ol%=L%(c%)
 1690 IF L%(c%)=0 PROCok("Can't copy fro
m Desktop!"):ENDPROC
 1700 pb$=pa$(c%)
 1710 fb$=fn$(c%,ch%(c%)):IFL%(c%)<0 sk%
=ch%(c%)
 1720 ab$=LEFT$(fa$(c%,ch%(c%)),3)
 1730 IF L%(c%)<0 AND ab$="Emp"PROCok("C
an't copy Empty ROMs!"):ENDPROC
 1740 IF ab$="DIR" PROCok("Can't copy Fo
lders!"):ENDPROC
 1750 PROCptrloop
 1760 IF py%>994 AND px%<160 THEN PROCam
:ENDPROC
 1770 IF py%>994 ENDPROC
 1780 IF f%=0 AND py%>500 c%=0
 1790 IF f%=0 AND py%<=500 c%=1
 1800 IF L%(c%)=0 PROCok("Can't copy ont
o a desktop!"):ENDPROC
 1810 IF L%(c%)=-1 AND pb$="Sideways ROM
S" PROCok("Can't copy between ROMS!"):EN
DPROC
 1820 IF L%(c%)=-1 PROCsrload:ENDPROC
 1830 action$="SAVE":IF ol%=-1 THEN PROC
image:ENDPROC
 1840 IF FNC("  MOVE  ","  COPY  "," FIL
E :"+fb$)=0 THEN action$="COPY" ELSE act
ion$="MOVE"
 1850 IF FNC(" CONFIRM "," CANCEL ",acti
on$+" FILE :"+fb$)=0 ENDPROC
 1860 LOCAL x,y:x=400:y=400
 1870 PROCmww(400,400,666,312)
 1880 GCOL 0,0:PROCbut(action$+" FILE",x
+240,y+234)
 1890 PROCtline("  Please type the name
of the new file  "," Press RETURN alone
to use current name.")
 1900 PRINTTAB(34,17);" File Name:";
 1910 *FX 12 0
 1920 fo$=FNgpi(10,no$+cap$+low$+"!%'()_
~\{[}]`")
 1930 *FX 12 3
 1940 *FX 11 5
 1950 IF fo$="" fo$=fb$
 1960 IF fo$=fb$ AND pb$=pa$(c%) THEN EN
DPROC
```

Continued ▶

◀ *JOE* front-end continued

```
 1970 fex=FALSE:FOR loop%=0 TO it%(c%):I
F fn$(c%,loop%)=fo$:fex=TRUE:loop%=it%(c
%)
 1980 NEXT
 1990 IF it%(c%)>=47 THEN PROCok("This f
older is full!"):ENDPROC
 2000 IF fex THEN PROCok(fo$+" already e
xists in this folder!"):ENDPROC
 2010 PROCh:OSCLI("DIR "+pb$)
 2020 OSCLI("MOVE "+fb$+" "+pa$(c%)+"."+
fo$)
 2030 IF action$="MOVE" THEN OSCLI("DEL.
 "+fb$)
 2040 IFL%(1-c%)>0:PROCget(pa$(1-c%),1-c
%)
 2050 PROCget(pa$(c%),c%)
 2060 ENDPROC
 2070 :
 2080 DEF PROCimage
 2090 IF FNC(" CONFIRM "," CANCEL ",acti
on$+" IMAGE :"+fb$)=0 THEN ENDPROC
 2100 LOCAL x,y:x=400:y=400
 2110 PROCmww(400,400,666,312)
 2120 GCOL 0,0:PROCbut(action$+" IMAGE",
x+240,y+234)
 2130 PROCtline(" Please type the name o
f the ROM image. ","Press RETURN alone t
o use name: ROMFILE.")
 2140 PRINTTAB(34,17);" Image Name:";
 2150 *FX 12 0
 2160 fo$=FNgpi(10,no$+cap$+low$+"!%'()_
~\{[}]`")
 2170 *FX 12 3
 2180 *FX 11 5
 2190 IF fo$="" fo$="ROMFILE"
 2200 fex=FALSE:FOR loop%=0 TO it%(c%):I
F fn$(c%,loop%)=fo$:fex=TRUE:loop%=it%(c
%)
 2210 NEXT
 2220 IF it%(c%)>=47 THEN PROCok("This f
older is full!"):ENDPROC
 2230 IF fex THEN PROCok(fo$+" already e
xists in this folder!"):ENDPROC
 2240 PROCh:OSCLI("DIR "+pa$(c%))
 2250 PROCsrom(sk%,fo$,16)
 2260 IFL%(1-c%)>0:PROCget(pa$(1-c%),1-c
%)
 2270 PROCget(pa$(c%),c%)
 2280 ENDPROC
 2290 :
 2300 DEF PROCsrload
 2310 skt%=FNcscr:IF skt%=0 PROCok("You
don't say which socket!"):ENDPROC
 2320 skt%=ch%(c%)
 2330 IF skt%<4 OR skt%>7 PROCok("Can't
load to ROM sockets!"):ENDPROC
 2340 IF FNC(" CONFIRM "," CANCEL ","LOA
D ROM IMAGE :"+fb$)=0 THEN ENDPROC
 2350 LOCAL x,y:x=400:y=400
 2360 PROCmww(400,400,666,312)
 2370 GCOL 0,0:PROCbut("LOAD ROM IMAGE",
x+212,y+234)
 2380 PROCtline("  Type the LOAD Address
 of the image,","  RETURN alone uses def
ault address. ")
 2390 PRINTTAB(34,17);" Address &";
 2400 *FX 12 0
 2410 adr$=FNgpi(10,no$+"ABCDEF")
 2420 *FX 12 3
 2430 *FX 11 5
 2440 IF adr$="" adr$=" 8000 " ELSE adr$
=" "+adr$+" "
```

Continued ▶

◀ *JOE* front-end continued

```
2450 IF ab$<>"ROM" THEN IF FNC("GO AHEA
D","  STOP  ","WARNING: Image query!")=0
 THEN ENDPROC
2460 PROCh
2470 OSCLI("SRLOAD "+fb$+adr$+STR$(skt%
))
2480 Y%=skt%:?&F7=&80:?&F6=&06
2490 chr%=(USR(&FFB9) AND &FF) AND 64
2500 IF chr%=64 ?(&2A1+skt%)=&C2 ELSE ?
(&2A1+skt%)=&82
2510 PROCreadroms
2520 PROCget(pa$(1-c%),1-c%)
2530 ENDPROC
2540 :
2550 DEF FNC(a$,b$,m$)
2560 LOCALx ,y,len,h,b1,b2:x=400:y=400:
len=480:h=200
2570 PROCmww(x,y,len,h):PROCbut(a$,x+32
,y+16)
2580 PROCbut(b$,x+304,y+16)
2590 VDU5:MOVE x+(len-(LEN(m$)*16))/2,y
+154:PRINTm$
2600 MOVE x+234,y+64:PRINT"or"
2610 REPEAT:PROCptrloop:b1=FNbut(x+32,y
+16,10*16,64)
2620 b2=FNbut(x+304,y+16,9*16,64)
2630 UNTIL b1=-1 OR b2=-1
2640 IF b1=-1 THEN =-1
2650 =0
2660 :
2670 DEF PROCok(m$):LOCALx,y,len,h,b2:x
=300:y=400:len=680:h=200
2680 PROCmww(x,y,len,h)
2690 PROCbut(" O.K. ",x+516,y+16)
2700 VDU 5
2710 MOVE x+(len-(LEN(m$)*16))/2,y+154:
PRINT m$
2720 MOVE x+52,y+64:PRINT"RETURN or Pre
ss this button:"
2730 PROCptrloop
2740 ENDPROC
2750 :
2760 DEF PROCerr
2770 *CLOSE
2780 c$=pointer$
2790 IF ERR=152 PROCok("Disc "+LEFT$(pa
$(c%),2)+" needs Compacting!"):PROCcompa
ct:PROCdesk:ENDPROC
2800 IF ERR=198 PROCok("Disc "+LEFT$(pa
$(c%),2)+" is full!"):PROCdesk:ENDPROC
2810 IF ERR=254 PROCok("I could not do
that last command!"):PROCdesk:ENDPROC
2820 IF ERR=150 PROCok("You're in that
directory!"):PROCdesk:ENDPROC
2830 IF ERR=151 PROCok("I cannot delete
the current Library!"):PROCdesk:ENDPROC
2840 IF ERR>=168 AND ERR<=170 PROCok("P
lease Hit CTRL-BREAK and restart"):PROCe
xit:END
2850 IF ERR=17 :L%(0)=0:L%(1)=0:PROCret
col:ENDPROC
2860 PROCok("Error: "+STR$(ERR)+ " at "
+STR$(ERL)):L%(0)=0:L%(1)=0:PROCretcol:E
NDPROC
2870 DEF PROCretcol:PROCpal:VDU4:GCOL0,
0:PROCdesk:ENDPROC
2880 DEF PROCcopyright:LOCALx,y,len,h:x
=400:y=400:len=666:h=312
2890 PROCmww(x,y,len,h)
2900 GCOL 0,0:PROCbut("    JOE    ",x+248
,y+234)
2910 VDU 5
```

Continued ▶

◀ *JOE* front-end continued

```
2920 MOVE x+16,y+220:PRINT"  The Jottin
gs Operating Environment."
2930 MOVE x+16,y+180:PRINT"  designed a
nd written by Joe Telford"
2940 MOVE x+16,y+140:PRINT"            V
1.00 - (c) 1987"
2950 MOVE x+16,y+64: PRINT" Press this
button:":PROCbut("   ok   ",x+400,y+16)
2960 GCOL 4,0
2970 REPEAT
2980 PROCptrloop
2990 UNTIL FNbut(x+400,y+16,7*16,64):EN
DPROC
3000 :
3010 DEF PROCmww(x,y,len,h)
3020 GCOL 0,1:PROCr(x,y,len,h,1)
3030 GCOL 0,0:PROCr(x,y,len,h,0)
3040 PROCr(x+8,y-4,len,4,1)
3050 PROCr(x+len,y-4,8,h,1)
3060 ENDPROC
3070 :
3080 DEF FNbut(x,y,L,H)
3090 =((px%>=x AND px%<=(x+L)) AND (py%
>=y AND py%<=(y+H)))
3100 ENDPROC
3110 :
3120 DEF PROCbut(m$,bx%,by%)
3130 GCOL 4,0:VDU 5:PROCr(bx%,by%,LEN(m
$)*16+16,64,0):GCOL 0,0:MOVE bx%+8,by%+4
8:PRINT m$
3140 VDU 4
3150 ENDPROC
3160 :
3170 DEF PROCdisp(x,y,L,H,w)
3180 GCOL 0,0
3190 PROCgemww(x*16-8,y*32-16,L*16+12,H
*32+16)
3200 VDU 26,4
3210 PRINT TAB(x,32-(y+H));cl$
3220 PRINT TAB(x+77,32-(y+H));"*"
3230 PRINT TAB(x+77,33-(y+H-1));up$
3240 PRINT TAB(x+77,31-y);down$;
3250 PROCpc(w,f%,L%(w))
3260 ENDPROC
3270 :
3280 DEF PROCpc(w,f,L%)
3290 GCOL 0,1
3300 IF w=0 AND f=0 VDU 4,28,1,15,76,3,
12:MOVE 1232,528:DRAW 1232,950
3310 IF f=1 VDU 4,28,1,30,76,3,12:PROCr
(34,26,1200,8,1)
3320 IF w=1 AND f=0 VDU 4,28,1,30,76,18
,12:MOVE 1232,26:DRAW 1232,448
3330 GCOL 4,0
3340 IF L%=0 it%(w)=ipus:PROCpdsk(w,f):
ENDPROC
3350 IF f=1 PROCpd(0,it%(w),w)
3360 IF f=0 PROCpd(sc%(w)*14,sc%(w)*14+
20,w)
3370 PROCscbar(w,f):GCOL 4,0
3380 PROCptl(w,f,pa$(w))
3390 VDU 26,5
3400 ENDPROC
3410 :
3420 DEF PROCptl(w,f,p$)
3430 IF w=0 OR (w=1 AND f=1) GCOL 0,1:P
ROCr(34,922,1208,32,1):GCOL 0,0:VDU 5:MO
VE (1280-LEN(RIGHT$(p$,75))*16)/2,954:PR
INTRIGHT$(p$,75):VDU 4:ENDPROC
3440 GCOL 0,1:PROCr(34,442,1208,32,1):G
COL 0,0:VDU 5:MOVE(1280-LEN(RIGHT$(p$,75
))*16)/2,474:PRINTRIGHT$(p$,75):VDU 4:EN
DPROC
```

Continued ▶

◀ *JOE* front-end continued

```
 3450 ENDPROC
 3460 :
 3470 DEF PROCpd(s,e,w)
 3480 CLS
 3490 FOR loop%=s TO e STEP 7
 3500 FOR row%=1 TO 7
 3510 IF (loop%+row%-1)<=e AND (loop%+ro
w%-1)<=it%(w) PRINT TAB((row%-1)*11,((lo
op%-s) DIV 7)*4);:PROCfiletype(loop%+row
%-1,w)
 3520 NEXT:NEXT
 3530 ENDPROC
 3540 :
 3550 DEF PROCfiletype(x,w)
 3560 IFL%(w)<0 PROCromtype:ENDPROC
 3570 IF LEFT$(fa$(w,x),4)="DIR " PRINTf
older$;STRING$((10-LEN(fn$(w,x)))/2," ")
;fn$(w,x);
 3580 IF LEFT$(fa$(w,x),4)<>"DIR " PRINT
doc$;:VDU 11:PRINTLEFT$(fa$(w,x),4);:VDU
 10,10,8,8,8,8,8,8,8:PRINTSTRING$((10-LE
N(fn$(w,x)))/2," ");fn$(w,x);
 3590 ENDPROC
 3600 :
 3610 DEF PROCromtype
 3620 IF x>3 AND x<8:PRINT ram1$;fa$(w,x
);ram2$;STRING$((10-LEN(fn$(w,x)))/2," "
);fn$(w,x);:ENDPROC
 3630 PRINTrom1$;fa$(w,x);rom2$;STRING$(
(10-LEN(fn$(w,x)))/2," ");fn$(w,x);:ENDP
ROC
 3640 ENDPROC
 3650 :
 3660 DEF PROCpdsk(w,f)
 3670 FOR loop%=0 TO it%(w) STEP 7
 3680 FOR row%=1 TO 7
 3690 IF (loop%+row%-1)<=it%(w) PRINTTAB
((row%-1)*11,(loop% DIV 7)*4);ip$(loop%+
row%-1,2);
 3700 NEXT:NEXT
 3710 PROCscbar(w,f)
 3720 PROCptl(w,f,pa$(w))
 3730 VDU 26,5
 3740 ENDPROC
 3750 :
 3760 DEF PROCgemww(x,y,L,H)
 3770 PROCr(x,y,L,H,0)
 3780 PROCr(x+8,y-8,L,8,1)
 3790 PROCr(x+L,y-8,8,H-8,1)
 3800 PROCr(x,y,L-24,H,0)
 3810 PROCr(x+L-24,y,24,60,0)
 3820 PROCr(x+L-24,y+H-106,24,68,0)
 3830 ENDPROC
 3840 :
 3850 DEF PROCr(x,y,l,w,f)
 3860 MOVE x,y
 3870 IF f=0 DRAWx+l,y:DRAWx+l,y+w:DRAWx
,y+w:DRAWx,y:ENDPROC
 3880 MOVE x+l,y:PLOT85,x,y+w-4:MOVEx,y+
w:MOVEx+l,y+4:PLOT85,x+l,y+w:MOVEx,y:END
PROC
 3890 :
 3900 DEF PROCgorom
 3910 rt$=LEFT$(fa$(c%,ch%(c%)),5)
 3920 IF rt$="Empty" PROCok("Cannot exec
ute Empty ROMS!"):PROCdesk:ENDPROC
 3930 IF rt$="Servi" PROCok("Cannot exec
ute Service ROMs!"):PROCdesk:ENDPROC
 3940 IF rt$="Unkno" PROCok("Cannot exec
ute ROMs of Unknown type!"):PROCdesk:END
PROC
 3950 IF rt$="Unplu" PROCinsert:PROCdesk
:ENDPROC
```

Continued ▶

◀ *JOE* front-end continued

```
 3960 PROCexit:OSCLI("FX 142 "+STR$(ch%(
c%))):END
 3970 :
 3980 DEF PROCinsert
 3990 IF FNC(" CONFIRM "," CANCEL ","INS
ERT ROM : "+fn$(c%,ch%(c%))) THEN:OSCLI(
"INSERT "+STR$(ch%(c%))):PROCreadroms:EN
DPROC
 4000 ENDPROC
 4010 :
 4020 DEF PROCdelrom
 4030 IF FNC(" CONFIRM "," CANCEL ","UNP
LUG ROM : "+fn$(c%,ch%(c%))) THEN:OSCLI(
"UNPLUG "+STR$(ch%(c%))):PROCreadroms:EN
DPROC
 4040 ENDPROC
 4050 :
 4060 DEF PROCgo
 4070 w=c%:cur=ch%(c%)
 4080 IF L%(w)=-1 PROCgorom:ENDPROC
 4090 OSCLI("DIR "+pa$(c%))
 4100 IF fn$(w,cur)="New Folder" THEN PR
OCnewfolder:PROCdesk:ENDPROC
 4110 at$=LEFT$(fa$(w,cur),4)
 4120 IF at$="BAS " THEN PROCexit:CHAINf
n$(w,cur):END
 4130 IF at$="ROM " THEN PROCok("First y
ou must copy to Sideways RAM!"):PROCdesk
:ENDPROC
 4140 IF at$="CODE" THEN PROCexit:OSCLI(
"*RUN "+fn$(w,cur))
 4150 IF at$="PROT" THEN PROCexit:OSCLI(
"*RUN "+fn$(w,cur))
 4160 IF at$="DIR " THEN PROCdirselect:E
NDPROC
 4170 IF at$="View" THEN PROCexit:OSCLI(
"*KEYO MODE 131|M*WORD|MSET FJI|MLOAD "+
fn$(w,cur)+"|MPRINTER $.DRIVERS.JUKI|M")
:OSCLI("FX138,0,128"):END
 4180 IF at$="Vsht" THEN PROCexit:OSCLI(
"*KEYO MODE 131|M*SHEET|MLOAD "+fn$(w,cu
r)+"|M"):OSCLI("FX138,0,128"):END
 4190 IF at$="Exec" THEN PROCexit:VDU12,
4:OSCLI("*EXEC "+fn$(w,cur)):END
 4200 ENDPROC
 4210 :
 4220 DEF PROCexit
 4230 REPEAT UNTIL INKEY$(30)=""
 4240 *FX 12 0
 4250 *FX 4 0
 4260 COLOUR 1:COLOUR128
 4270 VDU 4,26,12
 4280 ENDPROC
 4290 :
 4300 DEF PROCrfs(pa$)
 4310 PROCget(pa$,c%):L%(c%)=L%(c%)+1:PR
OCpc(c%,f%,L%(c%))
 4320 ENDPROC
 4330 :
 4340 DEF PROCdirselect
 4350 dir$=fn$(c%,ch%(c%)):pa$(c%)=pa$(c
%)+"."+dir$:PROCrfs(pa$(c%))
 4360 ENDPROC
 4370 :
 4380 DEF PROCrfsin(dir$,c%)
 4390 PROCh:OSCLI("DIR "+dir$):fn$(c%,0)
="New Folder"
 4400 it%(c%)=0:Blk%!0=0:Blk%!4=0:Blk%!8
=0:Blk%!12=0:PROCcall(8):PROCdecode
 4410 ENDPROC
 4420 :
 4430 DEF PROCrfinfo(c%)
```

Continued ▶

YELLOW PAGES

JOE'S JOTTINGS

◀ *JOE* front-end continued

```
 4440 fa$(c%,0)="DIR ******":IF it%(c%)=
 0 ENDPROC
 4450 FOR x%=1 TO it%(c%)
 4460 $Rx%=fn$(c%,x%):?Oblk%=Rx% MOD 256
:Oblk%?1=Rx% DIV 256
 4470 X%=Oblk% MOD 256:Y%=Oblk% DIV 256:
A%=5:A%=(USR(OSFILE%) AND &FF)
 4480 extn$="CODE"
 4490 IF A%=2 extn$="DIR "
 4500 IF A%=&FF extn$=":PRO:"
 4510 exadr%=(Oblk%!6 AND &FFFF):loadadr
%=(Oblk%!2)
 4520 IF extn$="CODE" THEN IF exadr%=&80
00 extn$="ROM "
 4530 IF extn$="CODE" THEN IF exadr%=&80
19 OR exadr%=&8023 OR exadr%=&802B extn$
="BAS "
 4540 IF extn$="CODE" THEN IF exadr%=&B8
19 OR exadr%=&B823 OR exadr%=&B82B extn$
="BAS "
 4550 IF extn$="CODE" THEN IF loadadr%=0
 AND exadr%=&FFFF extn$="DATA"
 4560 IF extn$="CODE" THEN IF loadadr%=0
 AND exadr%=0 extn$="DATA"
 4570 IF extn$="CODE" THEN IF (loadadr%
OR &20202020)=&76736874 extn$="Vsht"
 4580 IF extn$="CODE" THEN IF (loadadr%
OR &20202020)=&76696577 extn$="View"
 4590 IF extn$="CODE" THEN IF (loadadr%
OR &20202020)=&65786563 extn$="Exec"
 4600 att%=Oblk%?&E
 4610 IF (att% AND 1)   = 1   extn$=extn$+
"R"
 4620 IF (att% AND 2)   = 2   extn$=extn$+
"W"
 4630 IF (att% AND 8)   = 8   extn$=extn$+
"L"
 4640 IF (att% AND 16) = 16 extn$=extn$+
"r"
 4650 IF (att% AND 32) = 32 extn$=extn$+
"w"
 4660 IF (att% AND 128)=128 extn$=extn$+
"l"
 4670 fa$(c%,x%)=extn$
 4680 NEXT
 4690 ENDPROC
 4700 :
 4710 DEF PROCcall(no%)
 4720 Blk%?1 = Rx% MOD 256:Blk%?2 = Rx%
DIV 256:Blk%?5 = 1
 4730 X%= Blk% MOD 256:Y%= Blk% DIV 256:
C% = 0 : A% = no%:CALL OSGBPB%
 4740 ENDPROC
 4750 :
 4760 DEF PROCdecode
 4770 IF Blk%?5>0 ENDPROC
 4780 ?(Rx%+1+?Rx%)=13:it%(c%)=it%(c%)+1
 4790 dummy%=INSTR($(Rx%+1)," ")
 4800 IF dummy%=0 dummy%=11
 4810 fn$(c%,it%(c%))=LEFT$($(Rx%+1),dum
my%-1)
 4820 PROCcall(8):PROCdecode
 4830 ENDPROC
 4840 :
 4850 DEF PROCnewfolder:LOCALx,y,loop%:x
=400:y=400
 4860 PROCmww(400,400,666,312)
 4870 GCOL0,0:PROCbut("New Folder",x+240
,y+234)
 4880 PROCtline(" Please type the name o
f the new folder ","       Press RETURN a
lone to cancel.     ")
```

Continued ▶

◀ *JOE* front-end continued

```
 4890 PRINTTAB(34,17);" Folder Name:";
 4900 *FX 12 0
 4910 fo$=FNgpi(10,no$+cap$+low$+"!%'()_
~\{[}]`")
 4920 *FX 12 3
 4930 *FX 11 5
 4940 IF fo$="" ENDPROC
 4950 PROCget(pa$(c%),c%)
 4960 fex=FALSE:FOR loop%=0 TO it%(c%):I
F fn$(c%,loop%)=fo$:fex=TRUE:loop%=it%(c
%)
 4970 NEXT
 4980 IF it%(c%)>=47 THEN PROCok("This f
older is full!"):ENDPROC
 4990 IF fex THEN PROCok(fo$+" already e
xists in this folder!"):ENDPROC
 5000 IF LEN(pa$(c%)+"."+fo$)>240 PROCok
("Route to "+fo$+" is too long!"):ENDPRO
C
 5010 PROCh:OSCLI("CDIR "+pa$(c%)+"."+fo
$)
 5020 IFL%(1-c%)>0:PROCget(pa$(1-c%),1-c
%)
 5030 PROCget(pa$(c%),c%)
 5040 ENDPROC
 5050 :
 5060 DEF PROCtline(m$,n$)
 5070 VDU5
 5080 MOVE x+16,y+220:PRINTm$
 5090 MOVE x+16,y+180:PRINT"          Then
press the RETURN key."
 5100 MOVE x+16,y+140:PRINTn$
 5110 VDU4
 5120 ENDPROC
 5130 :
 5140 DEF FNgpi(len,valid$)
 5150 LOCAL a$,b
 5160 a$=""
 5170 PRINTSTRING$(len,".");STRING$(len,
CHR$(8));:*FX 15 1
 5180 b=GET:IF b=13 THEN =a$
 5190 IF b=127 AND a$="" THEN 5180
 5200 IF b=127 a$=LEFT$(a$,LEN(a$)-1):PR
INTCHR$b;".";CHR$(8);:GOTO5180
 5210 IF LEN(a$)=len OR INSTR(valid$,CHR
$b)=0 VDU7:GOTO 5180
 5220 PRINTCHR$b;:a$=a$+CHR$b:GOTO 5180
 5230 :
 5240 DEF PROCvalid
 5250 cap$="ABCDEFGHIJKLMNOPQRSTUVWXYZ"
 5260 low$="abcdefghijklmnopqrstuvwxyz"
 5270 no$="0123456789"
 5280 ENDPROC
 5290 :
 5300 DEF PROCget(pa$,w)
 5310 PROCrfsin(pa$,w):PROCrfinfo(w):sc%
(w)=0
 5320 ENDPROC
 5330 :
 5340 DEF PROCscbar(w,f)
 5350 IF f=1 GCOL0,0:PROCr(1250,86,12,76
0,1):ENDPROC
 5360 IF w=1 GCOL0,1:PROCr(1252,90,8,272
,1):GCOL0,0:PROCr(1250,86,12,280,0):PROC
r(1250,296-(sc%(w)*70),12,70,1):ENDPROC
 5370 IF w=0 GCOL0,1:PROCr(1252,568,8,27
2,1):GCOL0,0:PROCr(1250,566,12,280,0):PR
OCr(1250,776-(sc%(w)*70),12,70,1):ENDPRO
C
 5380 ENDPROC
 5390 :
 5400 DEF PROCpal:VDU 19,0,back|:VDU 19,
1,fore|:ENDPROC
```

Continued ▶

◄ *JOE* front-end continued

```
5410 :
5420 DEF PROCam:LOCAL mp,choice,max
5430 REPEAT UNTIL INKEY$(5)=""
5440 mp=1:IF c$=copy$ max=8: ELSE max=6
5450 REPEAT
5460 IF vol=1 s$=" Sound - On" ELSE s$=
" Sound - Off"
5470 K=FNwmenu(" Actions ",max," Close
this Window "," Foreground"," Background
",s$," *BYE "," Exit JOE"," Compact Curr
ent Disc "," Check Disk space","","")
5480 IF K=2 PROCfg
5490 IF K=3 PROCbg
5500 IF K=4 vol=1-vol:SOUND 1,vol*-15,1
48,2:UNTIL FALSE
5510 IF K=5 THEN *BYE
5520 IF K=6 PROCend
5530 IF K=7 PROCcompact
5540 IF K=8 PROCdiscspace
5550 UNTIL K=1
5560 ENDPROC
5570 :
5580 DEF PROCdiscspace
5590 OSCLI("DIR "+pa$(c%)):PROCopenww(2
0,10,40,10)
5600 OSCLI("MAP"):OSCLI("FREE")
5610 ENDPROC
5620 :
5630 DEF PROCcompact
5640 P%=LOMEM+256:F%=HIMEM-P%:P%=(P% DI
V 256):F%=(F% DIV 256)
5650 IF FNC(" CONFIRM "," CANCEL ","Com
pact Disc "+LEFT$(pa$(c%),2))=0 THEN OSC
LI("FX12,0"):OSCLI("FX4,0"):ENDPROC
5660 *FX 12 0
5670 *FX 4 0
5680 PROCh:OSCLI("DIR "+pa$(c%)):OSCLI(
"*COMPACT "+STR$~P%+" "+STR$~F%)
5690 *JOE
5700 END
5710 :
5720 DEF PROCfg
5730 back=(back+1)MOD 8:PROCpal:ENDPROC
5740 DEF PROCbg
5750 fore=(fore+1)MOD 8:PROCpal:ENDPROC
5760 DEF PROCend
5770 *FX 12 0
5780 *FX 4 0
5790 COLOUR 128:COLOUR 1:VDU26,12,4:*BA
SIC
5800 :
5810 DEF FNwmenu(m$(0),max,m$(1),m$(2),
m$(3),m$(4),m$(5),m$(6),m$(7),m$(8),m$(9
),m$(10))
5820 LOCAL loop%,len:len=0
5830 FOR loop%=0 TO 10:IF LEN(m$(loop%)
)>len THEN len=LEN(m$(loop%))
5840 NEXT
5850 VDU 23,1|
5860 PROCopenww(0,0,len,max+1)
5870 *FX 12 0
5880 REPEAT
5890 PRINT TAB(0,0);
5900 FOR loop%=0 TO max
5910 IF loop%=mp COLOUR 1:COLOUR 128 EL
SE COLOUR 0:COLOUR 129
5920 PRINT m$(loop%);STRING$(len-LEN(m$
(loop%))," ");:NEXT
5930 COLOUR 0:COLOUR 129
5940 key=GET
5950 IF key=139 mp=mp-1:IF mp=0:mp=max
5960 IF key=138 mp=mp+1:IF mp=max+1 mp=
1
```

Continued ►

◄ *JOE* front-end continued

```
5970 UNTIL key=13
5980 *FX 12 3
5990 *FX 11 5
6000 =mp
6010 :
6020 DEF PROCopenww(x,y,len,ht)
6030 VDU 28,x,y+ht,x+len-1,y,12
6040 GCOL 0,1:PROCr(x*16-4,1016-(y+ht+1
)*32,len*16+6,(ht+1)*32+12,1)
6050 GCOL 0,0
6060 PROCr(x*16-4,1016-(y+ht+1)*32,len*
16+6,(ht+1)*32+12,0)
6070 PROCr(x*16,1012-(y+ht+1)*32,len*16
+8,4,1)
6080 PROCr((x+len)*16,1012-(y+ht+1)*32,
8,(ht+1)*32+4,1)
6090 ENDPROC
6100 :
6110 DEF PROCh:GCOL 0,1
6120 IF px%<=48 PROCr(px%+32-4,py%-80,3
6,68,1) ELSE PROCr(px%-4,py%-32,36,68,1)
6130 VDU 5:GCOL 4,0
6140 IF px%<=48 MOVE px%+32,py%-16 ELSE
MOVE px%,py%+32
6150 PRINT H$:VDU4:ENDPROC
6160 :
6170 DEF PROCreadroms
6180 IF L%(c%)=-1 PROCrroms(c%)
6190 IF L%(1-c%)=-1 PROCrroms(1-c%)
6200 ENDPROC
6210 :
6220 DEF PROCrroms(w)
6230 PROCh
6240 LOCAL ch%,skt%
6250 FOR skt%=15 TO 0 STEP-1
6260 fn$(w,skt%)=FNgetname(skt%,10)
6270 ch%=?(&2A1+skt%)
6280 fa$(w,skt%)="Unknown "
6290 IF ch%=&C2 OR ch%=&60 fa$(w,skt%)=
"Language"
6300 IF ch%=&82 fa$(w,skt%)="Service "
6310 IF ch%=0 fa$(w,skt%)="Empty   "
6320 IF FNunplugged(skt%) THEN fa$(w,sk
t%)="Unplug'd"
6330 NEXT skt%
6340 it%(w)=15
6350 ENDPROC
6360 :
6370 DEF FNgetname(skt%,len)
6380 LOCAL title$,chr%
6390 title$=""
6400 Y%=skt%:?&F7=&80:?&F6=&08
6410 REPEAT:?&F6=?&F6+1
6420 chr%=(USR(&FFB9) AND &FF)
6430 IF chr%>31 AND chr%<127 title$=tit
le$+CHR$chr%
6440 UNTIL chr%<32 OR chr%>126 OR LEN(t
itle$)=len
6450 =title$
6460 :
6470 DEF FNunplugged(s%)
6480 A%=161:X%=6+(s%DIV8)
6490 =(2^(s%MOD8)=((255-((USR(&FFF4))AN
D &FF0000)DIV &10000) AND 2^(s%MOD8)))
6500 :
6510 DEF PROCsrom(skt%,f$,k%):LOCAL cha
%,chr%
6520 OSCLI("SAVE "+f$+" 8000 +4000 8000
8000"):cha%=OPENUPf$
6530 FOR loop%=&80 TO &80+(k%*4)-1:Y%=s
kt%:?&F7=loop%
6540 FOR iloop%=0 TO &FF:?&F6=iloop%:
```

Continued ►

◀ *JOE* front-end continued

```
 6550 BPUT #cha%,(USR(&FFB9) AND &FF):NE
XT:NEXT:CLOSE#cha%:ENDPROC
 6560 :
 6570 DEF PROCsetup
 6580 ch=OPENIN("defaults"):IF ch=0 PRIN
T"J.O.E. failed to find Desktop Info Fil
e!":END
 6590 INPUT #ch,jfolder$,fore,back,ipus
 6600 PROCpal
 6610 DIM ip$(ipus,2):ip$(ipus,0)="PAGED
 ":ip$(ipus,1)="ROMS"
 6620 FOR loop%=0 TO ipus-1:INPUT #ch,ip
$(loop%,0),ip$(loop%,1):NEXT:CLOSE#ch
 6630 down$=CHR$132
 6640 cl$=CHR$130
 6650 up$=CHR$131
 6660 copy$=CHR$155+CHR$156
 6670 ch=OPENIN(jfolder$+".Icons"):IF ch
=0 PRINT"J.O.E. failed to find Desktop I
con  File!":END
 6680 INPUT #ch,H$,disc$,hard$,net$,rom1
$,rom3$,rom2$,ram1$,ram3$,ram2$,doc$,fol
der$
 6690 CLOSE#ch
 6700 *FX 4 1
 6710 *FX 12 3
 6720 *FX 11 5
 6730 rom$=rom1$+rom3$+rom2$
 6740 ram$=ram1$+ram3$+ram2$
 6750 FOR loop%=0 TO ipus
 6760 IF ip$(loop%,0)="F" THEN ip$(loop%
,2)=disc$+"Floppy "+MID$(ip$(loop%,1),2,
1)
 6770 IF ip$(loop%,0)="H" THEN ip$(loop%
,2)=hard$+"Hard "+MID$(ip$(loop%,1),2,1)
 6780 IF ip$(loop%,0)="N" THEN ip$(loop%
,2)=net$+"Econet "+MID$(ip$(loop%,1),1,2
)
 6790 IF ip$(loop%,0)="PAGED " THEN ip$(
loop%,2)=rom$+ip$(loop%,0)+ip$(loop%,1)
 6800 NEXT
 6810 DIM L%(1):L%(0)=0:L%(1)=0
 6820 DIM pa$(1):pa$(0)="Desktop 0":pa$(
1)="Desktop 1"
 6830 DIM it%(1):it%(0)=ipus:it%(1)=ipus
 6840 DIM ch%(1):ch%(0)=0:ch%(1)=0
 6850 DIM sc%(1):sc%(0)=0:sc%(1)=0
 6860 DIM Blk% 16,Rx% 16,Oblk% 18
 6870 DIM fn$(1,50),fa$(1,50)
 6880 DIM m$(10)
 6890 OSGBPB%=&FFD1:OSFILE%=&FFDD
 6900 pointer$=CHR$129+CHR$128:c$=pointe
r$
 6910 ck%=0:c%=0:f%=0:vol=1:PROCvalid
 6920 PROCdesk:px%=64:py%=800:GCOL4,0
 6930 ENDPROC
```

Listing 3. *JOE* calculator

```
   10 REM Desktop calculator
   20 REM for use with J.O.E.
   30 REM By Joe Telford
   40 REM For BBC Master Series
   50 REM (C) Acorn User June 1987
   60 :
   70 zx%=@%
   80 @%=&0100090A
   90 zone%=@%:cx=8:cy=500:vol=1:dpflag=
0
  100 eqflag=0:mem$="0":opflag=0:sx=700:
sy=200:acc$="0":op$=""
```

Continued ▶

◀ *JOE* calculator continued

```
  110 py%=512:px%=640
  120 PROCcalc(sx,sy):GCOL4,0:VDU5:MOVEp
x%,py%:GCOL4,0:PRINTc$
  130 ON ERROR PROCerr
  140 REPEAT:off=FALSE:REPEAT:PROCmovept
r:UNTILINKEY-74
  150 IF px%>sx+10 AND py%>sy AND px%<sx
+250 PROCdecode
  160 UNTIL off=TRUE:*FX12,0
  170 VDU4:*FX4,0
  180 @%=zx%
  190 CHAIN"JOETOP"
  200 END
  210 :
  220 DEF PROCerr
  230 IF ERR=18 acc$="  Division by 0":P
ROCdisp:acc$="0":op$="":ENDPROC
  240 REPORT:PRINT'" at ";ERL:*FX12 0
  250 END
  260 :
  270 DEF PROCdecode
  280 k=INT((px%-sx-11)/60)+INT((370+sy-
py%)/60)*4
  290 IF k>23 OR k<0 ENDPROC
  300 SOUND0,vol*-15,2,2:PROCi
  310 IF k=0 PROCcm:ENDPROC
  330 IF k=2 PROCca:ENDPROC
  340 IF k=3 off=TRUE:ENDPROC
  350 IF k=4 PROCrm:ENDPROC
  360 IF k=5 PROCsm:ENDPROC
  370 IF k=6 PROCpercent:ENDPROC
  380 IF k=7 PROCplusmin:ENDPROC
  390 IF k=8 OR k=9 OR k=10 PROCenter(ST
R$(k-1)):ENDPROC
  400 IF k=12 OR k=13 OR k=14 PROCenter(
STR$(k-8)):ENDPROC
  410 IF k=16 OR k=17 OR k=18 PROCenter(
STR$(k-15)):ENDPROC
  420 IF k=20 PROCenter("0"):ENDPROC
  430 IF k=21 PROCenter("."):ENDPROC
  440 IF k=11 PROCop("*"):ENDPROC
  450 IF k=15 PROCop("/"):ENDPROC
  460 IF k=19 PROCop("-"):ENDPROC
  470 IF k=22 PROCop("+"):ENDPROC
  480 IF k=23 PROCequals:ENDPROC
  490 ENDPROC
  500 :
  510 DEF PROCdisp
  520 IF acc$="" acc$="0"
  530 dac$=acc$:VDU5:GCOL0,0:PROCr(sx+12
,sy+408,248,42,1):GCOL4,0
  540 MOVEacx+16*(15-LENdac$),acy:PRINTd
ac$:IF VAL(mem$)=0 GCOL0,1 ELSE GCOL0,0
  550 MOVE acx+16,acy-42:PRINT"*":GCOL4,
0:ENDPROC
  560 :
  570 DEF PROCcm
  580 mem$="0":PROCdisp:ENDPROC
  590 :
  600 DEF PROCcl
  610 acc$="0":PROCdisp:dpflag=0:ENDPROC
  620 :
  630 DEF PROCca
  640 acc$="0":op$="":PROCdisp:dpflag=0:
ENDPROC
  650 :
  660 DEF PROCrm
  670 acc$=mem$:dpflag=0
  680 IF INSTR(acc$,".")>0 dpflag=1
  690 PROCdisp:ENDPROC
  700 :
  710 DEF PROCsm
  720 mem$=acc$:PROCdisp:ENDPROC
```

Continued ▶

◀ *JOE* calculator continued

```
730 :
740 DEF PROCpercent
750 IF op$="" OR INSTR("*+/-",RIGHT$(op$,1))<1 op$=acc$+"/100"
760 IF RIGHT$(op$,1)="*" THEN  op$=op$+acc$+"/100"
770 IF RIGHT$(op$,1)="/" THEN  op$="("+op$+acc$+")*100"
780 IF RIGHT$(op$,1)="+" THEN  op$=op$+"(("+op$+"0)*"+acc$+"/100)"
790 IF RIGHT$(op$,1)="-" THEN  op$=op$+"(("+op$+"0)*"+acc$+"/100)"
800 acc=EVAL(op$)
810 IFABS(acc)>0.000000009 AND ABS(acc)<0.1 PROCsetzone(ABS(acc))
820 acc$=STR$acc
830 PROCdisp
840 op$="":eqflag=1:@%=zone%
850 ENDPROC
860 :
870 DEF PROCplusmin
880 IF LEFT$(acc$,1)="-" THEN acc$=MID$(acc$,2,LENacc$):PROCdisp:ENDPROC
890 acc$="-"+acc$:PROCdisp
900 ENDPROC
910 :
920 DEF PROCop(s$)
930 dpflag=0
940 IF INSTR("*+/-",RIGHT$(op$,1))<1 op$=acc$+s$:acc$="0":opflag=1:ENDPROC
950 IF opflag=1 op$=LEFT$(op$,LEN(op$)-1)+s$:ENDPROC
960 acc=EVAL(op$+acc$)
970 IFABS(acc)>0.000000009 AND ABS(acc)<0.1 PROCsetzone(ABS(acc))
980 acc$=STR$acc
990 PROCdisp:op$=acc$+s$:acc$="0":@%=zone%
1000 ENDPROC
1010 :
1020 DEF PROCsetzone(x)
1030 LOCALloop%,places%:@%=&0102090A
1040 FOR loop%=LEN(STR$(x)) TO 1 STEP-1
1050 IF MID$(STR$x,loop%,1)<>"0":places%=loop%:loop%=1
1060 NEXT:IF places%=LEN(STR$(x)):ENDPROC
1070 @%=&01020000+(places%-2)*&100+&0A
1080 ENDPROC
1090 :
1100 DEF PROCequals
1110 acc=EVAL(op$+acc$):dpflag=0
1120 IFABS(acc)>0.000000009 AND ABS(acc)<0.1  PROCsetzone(ABS(acc))
1130 acc$=STR$(acc)
1140 PROCdisp:op$="":eqflag=1:@%=zone%:ENDPROC
1150 :
1160 DEF PROCenter(x$)
1170 IF dpflag=1 AND x$="." THEN ENDPROC
1180 IF dpflag=0 AND (LEFT$(acc$,2)="-0" OR LEFT$(acc$,1)="0") AND x$="0" THEN x$=""
1190 IF eqflag=1 acc$="0":eqflag=0
1200 IF LENacc$=13 AND LEFT$(acc$,1)<>"-" THEN ENDPROC
1210 IF LENacc$=14 AND LEFT$(acc$,1)="-" THEN ENDPROC
1220 IF x$="." THEN dpflag=1
1230 IFacc$="-0" AND x$<>"." THEN acc$="-"+x$:PROCdisp:opflag=0:ENDPROC
```

Continued ▶

◀ *JOE* calculator continued

```
1240 IF acc$="0" AND x$="." THEN acc$=acc$+x$:PROCdisp:opflag=0:ENDPROC
1250 IFacc$="0" THEN acc$=x$ ELSE acc$=acc$+x$
1260 PROCdisp:opflag=0:ENDPROC
1270 :
1280 DEF PROCi:GCOL4,0:PROCr(sx+27+(k MOD 4)*60,sy+330-(k DIV 4)*60,36,32,1)
1290 REPEAT UNTIL INKEY$(5)=""
1300 PROCr(sx+27+(k MOD 4)*60,sy+330-(k DIV 4)*60,36,32,1):ENDPROC
1310 :
1320 DEF PROCmoveptr:MOVEpx%,py%
1330 IF INKEY-58 AND py%<1024 PRINTc$:py%=py%+8:MOVEpx%,py%:PRINTc$:MOVEpx%,py%
1340 IF INKEY-42 AND py%>32 PRINTc$:py%=py%-8:MOVEpx%,py%:PRINTc$:MOVEpx%,py%
1350 IF INKEY-122 AND px%<1250 PRINTc$:px%=px%+8:MOVEpx%,py%:PRINTc$:MOVEpx%,py%
1360 IF INKEY-26 AND px%>0 PRINTc$:px%=px%-8:MOVEpx%,py%:PRINTc$:MOVEpx%,py%
1370 IF INKEY-56 THEN *SDUMP+
1380 ENDPROC
1390 :
1400 DEF PROCcalc(x,y)
1410 VDU23,129,255,252,252,195,0,0,0,0
1420 VDU 23,128,0,0,0,0,192,48,12,3
1430 VDU 4:COLOUR1:COLOUR128:*FX 4 1
1440 *FX 12 3
1450 *FX 11 5
1460 VDU 5:acx=x+18:acy=y+440
1470 VDU 23,200,0,24,0,255,0,24,0,0
1480 RESTORE
1490 GCOL 0,1:PROCr(x,y,272,484,1)
1500 GCOL 0,0:PROCr(x,y,272,484,0)
1510 PROCr(x+8,y-8,272,8,1):PROCr(x+272,y-8,8,484,1)
1520 FORloop%=x+8 TO x+248STEP16:PROCr(loop%,y+402,16,54,0):NEXT
1530 GCOL0,0:PROCr(x+8,y+402,256,54,0)
1540 PROCr(x+12,y+408,248,42,1)
1550 FOR row=0 TO 5:FOR key=0 TO 3:READ x$
1560 PROCbutton(x$,x+27+key*60,y+330-row*60):NEXT,
1570 PROCdisp:ENDPROC
1580 :
1590 DEF PROCbutton(x$,x,y):GCOL0,0:PROCr(x-4,y-6,44,42,1):GCOL0,1
1600 MOVE x+(36-LENx$*16)/2,y+28:IF x$="/" PRINTCHR$(200):ELSE PRINTx$
1610 c$=CHR$129+CHR$128:ENDPROC
1620 :
1630 DEF PROCr(x,y,l,w,f)
1640 MOVE x,y:IF f=0 DRAW x+l,y:DRAWx+l,y+w:DRAW x,y+w:DRAW x,y:ENDPROC
1650 MOVE x+l,y:PLOT85,x,y+w-4:MOVEx,y+w:MOVEx+l,y+4:PLOT85,x+l,y+w:MOVEx,y:ENDPROC
1660 DATA CM,CL,CA,OF,RM,SM,%,+-,7,8,9,x,4,5,6,/,1,2,3,-,0,.,+,=
```

Listing 4. *JOE* command creator

```
10 REM '*JOE' Command creator
20 REM By Joe Telford
30 REM For BBC Master Series
40 REM (c) Acorn User June 1987
50 :
60 start% =&900
70 oscli=&FFF7
```

Continued ▶

◄ *JOE* command creator continued

```
  80 osbyte=&FFF4
  90 REM Alter next line to match the J
.O.E. source directory
 100 com$= "*KEY 0 *BASIC|M*SH.|MMODE 1
28|M*DIR :0.$.JOE|MCH."+CHR$34+"JOEVDU"+
CHR$34+"|M"+CHR$13
 110 FOR pass = 0 TO 3 STEP 3
 120 P%=start%
 130 [OPT pass
 140 LDX #string MOD 256
 150 LDY #string DIV 256
 160 JSR oscli
 170 LDX #0
 180 LDY #128
 190 LDA #138
 200 JSR osbyte
 210 RTS
 220 .string
 230 EQUS com$
 240 NOP:]
 250 NEXT
 260 REM Alter next line to match your
library pathname + ".JOE"
 280 OSCLI("SAVE JOE 900 +100")
```

Listing 5. *JOE* icon file creator

```
  10 REM 'Icons' file creator
  20 REM By Joe Telford
  30 REM For BBC Master Series
  40 REM (c) Acorn User June 1987
  50 :
  60 H$=CHR$158+CHR$159+CHR$10+CHR$8+CH
R$8+CHR$160+CHR$161
  70 disc$=" "+CHR$133+STRING$(4,CHR$1
34)+CHR$162+CHR$10+STRING$(6,CHR$8)+CHR$
136+" "+CHR$141+CHR$142+"."+CHR$137+CHR$
10+STRING$(6,CHR$8)+CHR$138+CHR$139+CHR$
163+CHR$164+CHR$139+CHR$140+CHR$10+STRIN
G$(7,CHR$(8))
  80 hard$=" "+CHR$133+STRING$(4,CHR$1
34)+CHR$135+CHR$10+STRING$(6,CHR$8)+CHR$
136+"    O"+CHR$137+CHR$10+STRING$(6,CHR$
8)+CHR$138+STRING$(4,CHR$157)+CHR$140+CH
R$10+STRING$(6,CHR$(8))
  90 net$=" "+STRING$(5,CHR$165)+CHR$1
66+CHR$10+STRING$(6,CHR$8)+STRING$(5,CHR
$167)+CHR$168+CHR$10+STRING$(6,CHR$8)+ST
RING$(5,CHR$169)+CHR$170+CHR$10+STRING$(
8,CHR$8)
 100 rom1$=CHR$133+STRING$(8,CHR$144)+C
HR$135+CHR$10+STRING$(10,CHR$8)+CHR$143
 110 rom3$=STRING$(8," ")
 120 rom2$=CHR$137+CHR$10+STRING$(10,CH
R$8)+CHR$138+STRING$(8,CHR$145)+CHR$140+
CHR$10+STRING$(10,CHR$(8))
 130 ram1$=CHR$133+STRING$(8,CHR$134)+C
HR$162+CHR$10+STRING$(10,CHR$8)+CHR$143
 140 ram3$=STRING$(8," ")
 150 ram2$=CHR$137+CHR$10+STRING$(10,CH
R$8)+CHR$138+STRING$(8,CHR$139)+CHR$140+
CHR$10+STRING$(10,CHR$(8))
 160 doc$=" "+CHR$133+STRING$(4,CHR$13
4)+CHR$146+CHR$10+STRING$(6,CHR$8)+CHR$1
36+"     "+CHR$137+CHR$10+STRING$(6,CHR$8
)+CHR$138+STRING$(4,CHR$139)+CHR$140+STR
ING$(5,CHR$(8))
 170 folder$=CHR$147+CHR$150+CHR$150+CH
R$148+STRING$(5,CHR$149)+CHR$152+CHR$10+
STRING$(10,CHR$8)+CHR$151+CHR$133+STRING
```

Continued ►

◄ *JOE* icon file creator continued

```
$(7,CHR$134)+CHR$153+CHR$10+STRING$(10,C
HR$8)+CHR$154+CHR$138+STRING$(7,CHR$139)
+CHR$140+CHR$10+STRING$(10,CHR$(8))
 180 ch=OPENOUT"Icons"
 190 PRINT#ch,H$,disc$,hard$,net$,rom1$
,rom3$,rom2$,ram1$,ram3$,ram2$,doc$,fold
er$
 200 CLOSE#ch
 210 END
```

Listing 6. *JOE* default file creator

```
  10 REM 'defaults' file creator
  20 REM By Joe Telford
  30 REM For BBC Master Series
  40 REM (c) Acorn User June 1987
  50 :
  60 REPEAT
  70 MODE 3
  80 PRINT "J.O.E. Desktop Environment
 Information File:"
  90 INPUT '"What colour is the default
 desktop (0-7) "back
 100 INPUT '"What colour are the icons
to be?   (0-7) "fore
 110 UNTIL back <> fore
 120 INPUT '"Are you using ADFS or NFS?
          (A/N) "fs$
 130 IF LEFT$(fs$,1)="a" OR LEFT$(fs$,1
)="A" PROCadfs ELSE PROCnet
 140 PRINT '"What is the full pathname
(including :drive-number.)"
 150 INPUT "of the J.O.E  directory ...
..............."path$
 160 PRINT '"Please wait while I save y
our Info-file!"
 170 OSCLI("DIR "+path$)
 180 ch=OPENOUT("defaults")
 190 PRINT #ch,path$
 200 PRINT #ch,back,fore,icons
 210 PRINT "JOE located in: ";path$
 220 PRINT "Background colour: ";back
 230 PRINT "Foreground colour: ";fore
 240 PRINT "No of Icons:       ";icons
 250 FOR loop%=1 TO icons
 260 T$=type$(loop%):R$=root$(loop%)
 270 IF T$="N" PRINT"Econet fileserver
Disc ";R$
 280 IF T$="F" PRINT"Floppy Disc ";R$
 290 IF T$="H" PRINT"Hard Disc ";R$
 300 IF T$<>"N" AND T$<>"H" AND T$<>"F"
 PRINT"Error with icon ";loop%" ..."T$"/
"R$
 310 PRINT #ch,T$,R$
 320 NEXT
 330 CLOSE #ch
 340 PRINT'"Done!"
 350 END
 360 :
 370 DEF PROCnet
 380 REPEAT
 390 INPUT "How many discs on your File
 Server? "icons
 400 UNTIL icons>0
 410 DIM type$(icons),root$(icons)
 420 FOR loop%=1 TO icons
 430 PRINT "What is FS disc ";loop%-1;
 440 INPUT '" called? "root$(loop%)
 450 root$(loop%)=root$(loop%)+".$":typ
e$(loop%)="N"
 460 NEXT
 470 ENDPROC
```

Continued ►

◄ *JOE* default file creator continued

```
 480 :
 490 DEF PROCadfs
 500 REPEAT
 510 INPUT "How many discs on your syst
em? "icons
 520 UNTIL icons>0
 530 DIM type$(icons),root$(icons)
 540 FOR loop%=1 TO icons
 550 PRINT "Disc "loop%
 560 INPUT "Is this disc Hard or Floppy
? (H/F) "type$(loop%)
 570 IF LEFT$(type$(loop%),1)="h" OR LE
FT$(type$(loop%),1)="H" type$(loop%)="H"
 580 IF LEFT$(type$(loop%),1)="f" OR LE
FT$(type$(loop%),1)="F" type$(loop%)="F"
 590 PRINT "What is its disc number?"
 600 INPUT "(eg 0,1,4,5,etc) ..........
....... "root$(loop%)
 610 root$(loop%)=":"+root$(loop%)+".$"
 620 NEXT
 630 ENDPROC
```

BSTAMP

The listing below creates a machine code file called 'STAMP', that provides a way of identifying all your files, by saving a four-character label with the file. The label can be used to tell what type of file it is – a Basic program, a View *letter, a* ViewSheet *spreadsheet. For example: *STAMP LETTER VIEW saves the label 'VIEW' with the file 'LETTER'.*

JOE *automatically makes use of the labels 'VIEW' and 'VSHT' to identify* View *and* ViewSheet *files. Further labels can be used by adding to PROCgo in Joe's listing 2.*

BSTAMP listing 1

```
  10 REM *STAMP <filename> <code>
  20 REM puts a 4 character ASCII code
  30 REM in place of any files load add
ress
  40 REM eg *STAMP letter VIEW
  50 REM will replace the load address
  60 REM of 'letter' with 'VIEW'
  70 REM (c) Acorn User June 1987
  80 :
  90 adrs=&70
 100 osargs=&FFDA
 110 osfile=&FFDD
 120 gsinit=&FFC2
 130 gsread=&FFC5
 140 stamp%=&900
 150 FOR pass = 0 TO 3 STEP 3
 160 P%=stamp%
 170 [
 180 OPTpass
 190 LDX #adrs
 200 LDY #0
 210 LDA #1
 220 JSR osargs
 230 LDA adrs
 240 STA &F2
 250 LDA adrs+1
 260 STA &F3
 270 LDY #0
 280 CLC
 290 .getchr
 300 JSR gsinit
 310 BEQ crash
 320 .over
 330 JSR gsread
```

Continued ►

◄ BSTAMP listing 1 continued

```
 340 BCS out
 350 STA buffer-1,Y
 360 JMP over
 370 .out
 380 CMP #13
 390 BEQ crash
 400 LDA #13
 410 STA buffer-1,Y
 420 CLC
 430 JSR gsinit
 440 BEQ crash
 450 LDX #4
 460 .over2
 470 DEX
 480 JSR gsread
 490 STA osfileblock+2,X
 500 BCS out2
 510 CPX #0
 520 BNE over2
 530 .out2
 540 LDA #buffer MOD 256
 550 STA osfileblock
 560 LDA #buffer DIV 256
 570 STA osfileblock+1
 580 LDX #osfileblock MOD 256
 590 LDY #osfileblock DIV 256
 600 LDA #2
 610 JSR osfile
 620 CMP #1
 630 BEQ exit
 640 BRK
 650 EQUB &80
 660 EQUS "Can't find that file!"+CHR$1
3
 670 BRK
 680 .exit
 690 RTS
 700 .crash
 710 BRK
 720 EQUB &81
 730 EQUS "STAMP <fname> <CODE>"+CHR$13
 740 BRK
 750 BRK
 760 .osfileblock
 770 EQUD &0
 780 EQUD &0
 790 EQUD &0
 800 EQUD &0
 810 EQUW &0
 820 .buffer
 830 ]
 840 NEXT
 850 OSCLI("SAVE STAMP 900 +100")
```

Top of the list

This program allows the AMX Mouse (and others) to be used without the Mouse ROM. Once the assembled code is called, as at line 1550, the position of the mouse is stored in xlo% and ylo%, and continuously updated. Lines 1570-1590 show how to read the mouse position and convert to screen co-ordinates. The mouse buttons can be checked with FNbut (number%), where number% is 1, 2 or 3.

Mouse Reader listing 1

```
  10 REM AMX Mouse Read
er
  20 REM By Robert John
son-Perkins
  30 REM For BBC B/B+/M
/E + Mouse
```

Continued ►

◀ **Mouse listing continued**

```
   40 REM (c) Acorn User
 June 1987
   50 :
   60 MODE 4
   70 VDU 23;8202;0;0;0;
   80 PROCinit
   90 PROCassemble
  100 PROCchecksum
  110 PROCtest
  120 END
  130 :
  140 DEF PROCinit
  150 xlo%=&70:xhi%=&71:
ylo%=&72
  160 yhi%=&73:xmax%=&74
:ymax%=&75
  170 ?ylo%=0:?yhi%=0:?x
lo%=0
  180 ?xhi%=0:?xmax%=1:?
ymax%=1
  190 orb=&FE60:ifr=&FE6
D:ier=&FE6E
  200 irq1v=&204
  210 ENDPROC
  220 :
  230 DEF PROCassemble
  240 FOR opt%=0 TO 2 ST
EP 2:P%=&900
  250 [OPT opt%
  260 .setup
  270 SEI
  280 LDA #152
  290 STA ier
  300 LDA irq1v
  310 STA oldirq
  320 LDA irq1v+1
  330 STA oldirq+1
  340 LDA #ser MOD 256
  350 STA irq1v
  360 LDA #ser DIV 256
  370 STA irq1v+1
  380 CLI
  390 RTS
  400 .quit
  410 SEI
  420 LDA #24
  430 STA ier
  440 LDA oldirq
  450 STA irq1v
  460 LDA oldirq+1
  470 STA irq1v+1
  480 CLI
  490 RTS
  500 .ser
  510 PHP
  520 PHA
  530 TXA
  540 PHA
  550 TYA
  560 PHA
  570 LDA ifr
  580 AND #&80
  590 BEQ exit
  600 LDA ifr
  610 AND #8
  620 BNE vert
  630 JMP hori
  640 .out
  650 LDA ifr
  660 ORA #&7F
  670 STA ifr
  680 .exit
  690 PLA
  700 TAY
  710 PLA
  720 TAX
  730 PLA
  740 PLP
  750 JMP (oldirq)
  760 .vert
  770 LDA orb
  780 AND #4
  790 BEQ decy
  800 LDA yhi%
  810 CMP ymax%
  820 BEQ out
  830 INC ylo%
  840 BNE out
  850 INC yhi%
  860 JMP out
  870 .decy
  880 DEC ylo%
  890 LDA ylo%
  900 CMP #&FF
  910 BNE out
  920 DEC yhi%
  930 LDA yhi%
  940 CMP #&FF
  950 BNE out
  960 LDA #0
  970 STA ylo%
  980 STA yhi%
  990 JMP out
 1000 .hori
 1010 LDA orb
 1020 AND #1
 1030 BEQ decx
 1040 LDA xhi%
 1050 CMP xmax%
 1060 BEQ out
 1070 INC xlo%
 1080 BNE out
 1090 INC xhi%
 1100 JMP out
 1110 .decx
 1120 DEC xlo%
 1130 LDA xlo%
 1140 CMP #&FF
 1150 BNE out
 1160 DEC xhi%
 1170 LDA xhi%
 1180 CMP #&FF
 1190 BNE out
 1200 LDA #0
 1210 STA xlo%
 1220 STA xhi%
 1230 JMP out
 1240 .button
 1250 EOR #3
 1260 TAX
 1270 INX
 1280 LDA #0
 1290 SEC
 1300 .shift
 1310 ROR A
 1320 DEX
 1330 BNE shift
 1340 AND orb
 1350 BEQ set
 1360 LDA #0
 1370 RTS
 1380 .set
 1390 LDA #1
 1400 RTS
 1410 .oldirq
 1420 BRK
 1430 BRK
 1440 ]NEXT
 1450 ENDPROC
 1460 :
 1470 DEF PROCchecksum
 1480 T%=0:FOR I%=setup
TO P%-1
 1490 T%=T%+?I%:NEXT
 1500 IF T%=25907 ENDPRO
C
 1510 VDU 7:PRINT"Checks
um error - please check
listing"
 1520 END
 1530 :
 1540 DEF PROCtest
 1550 CALL setup
 1560 REPEAT
 1570 xco%=(!xlo% AND &F
FFF)*4
 1580 yco%=(!ylo% AND &F
FFF)*4
 1590 DRAW xco%,yco%
 1600 UNTIL FALSE
 1610 ENDPROC
 1620 :
 1630 DEF FNbut(A%)
 1640 =USR(button)AND&FF
```

June listings

The easiest way to enter the listings is to buy the monthly listings disc or cassette. It saves time and avoids errors, especially with a program as long as Joe Telford's front-end! The disc is fully menu-driven and an excellent buy at only £5.95. The cassette version for the BBC micro and Electron contains a tape to disc transfer program and costs £3.95.

And remember there's a graphics bonus on the cassette and disc each month to add to your gallery library.

*The listings can also be downloaded from Micronet if you have a Micronet subscription (page 600 600 890A). The Acorn User software can be downloaded just like any other programs from Prestel. Go to the first page by entering *600600890#. From there the operation is fully prompted. The charge for the software from Micronet is £5.00, so you can save money too.*

Finally, if you've typed in a program, and you just can't see your typing mistakes, then a set of checksums is available free of charge for all the yellow page programs. Send a large stamped self-addressed envelope (26p stamp) to AUChecksums, PO Box 641, London NW9 8TF. Included with each checksum pack is Tessie Revivis' program that allows you to find which line of your typing doesn't match the printed program.

To order the monthly disc or cassette, use the order form on *page 129 (opposite).*

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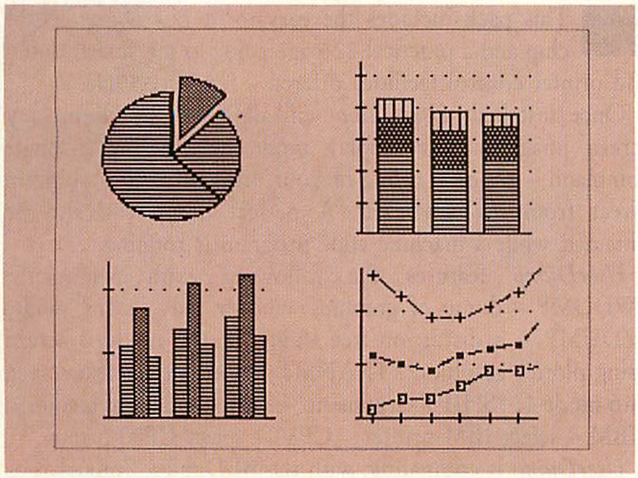
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OFFERS

CHART SOFTWARE



Improve your presentation with ViewChart

BBC/B/ B+/M/ C Do you use your micro to prepare figures? Perhaps in *ViewSheet* or *ViewStore*? Do you make printed reports? This business graphics program from *Acorn User* contributor Peter Sandford is aimed at anyone who uses figures, and wishes to improve the quality of their work.

ViewChart takes your numeric data from a *ViewSheet* file or *ViewStore* file, or manually, and plots various chart formats to screen. In one plot you can produce between one and five piecharts, stacked bar charts up to 25 bars, grouped bar charts up to 24 bars and line graphs with up to five lines each of 40 plotted points.

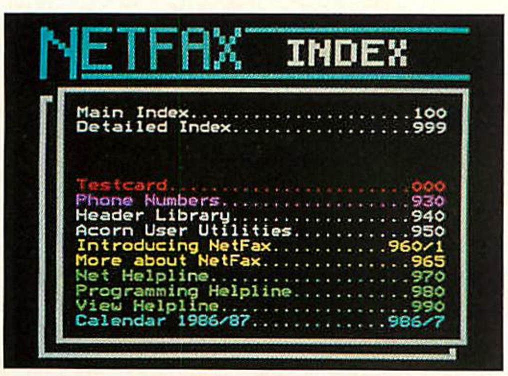
In practice, most business presentation data such as sales figures, departmental breakdowns, cost analyses and so on can be presented in a form even the boss will understand!

You can even add extra text and graphics to the completed chart prior to saving or printing. A screen dump program is provided, for Epson and compatible printers, which is specifically designed to fit the width of an A4 page. Instructions are provided on interfacing to other printers. *ViewChart* works in screen mode 0, using full shading effects, so what you see on screen is what you get on paper, and includes some tips on final presentation of graphics in documents.

ViewChart is supplied on 40-track 5.25-inch disc and works on the BBC models B and B+ and Master 128.

And the price of this professional software? Just £12.95.

DISCS



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Plus there are 150 *Netfax* pages covering instructions, help and indexes, all on a 5.25-inch disc for £19.95.

DISCS



Disc for all sideways RAM users

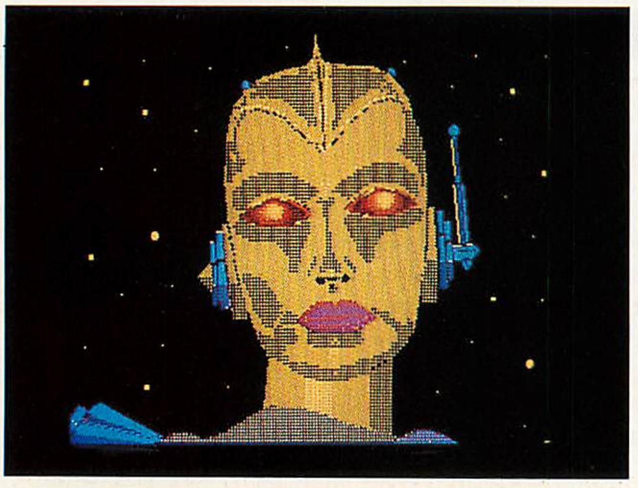
BBC/B/ B+/M/ C The *Sideways RAM Utilities* disc includes: *RamPad* – your computer's answer to the pad and pen. *On-Screen Fonts* – a variety of print styles available in all graphics modes. * HLP ROM – add your own help text to call up when you're stuck. Standard ROM header for use when writing your own ROMs. * RLOOK to examine the contents of your ROMs and sideways RAM images.

There are many more utilities on this 40-track 5.25-inch disc with a transfer program for 80-track users, and it's competitively priced at £9.95.

Acorn User order form on page 130 – 24 hour telephone service (0672) 40825

OFFERS

D U M P R O M S



Printer control with the UserDump ROM

BBC/B/ B+/M/ C/E This pack includes the easy-to-fit *UserDump* ROM chip and a practical 22-page guide to the screen dump and printer control facilities offered – for just £19.95.

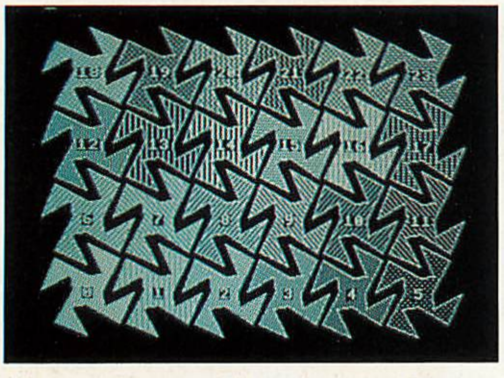
Once installed, *UserDump* will allow you to dump any screen image in any display mode by entering a single command – either as a line of your program or by typing in direct from the keyboard. A perfect dump can also be obtained while a machine code program is running.

UserDump features the following extra commands: *WDUMP – dump of graphics window only in any mode; *ZDUMP – a distortion-free dump of the mode 0 screen using plotter graphics; *TRANSIT – translate teletext screen into mode 1; *SHIFT ‹argument› – shift any area of memory; *IBM – select IBM printer; *CP80 – select CP80 printer.

UserDump is compatible with the BBC micro (model B or B+) fitted with operating system 1.2. Any earlier version will cause problems. *UserDump* is fully compatible with the Acorn 6502 second processor. It works with any printer which has single density and double density bit image graphics, including all Epson (LX, RX and FX) printers, Star Gemini and Delta, SG, SD and SR, Canon and Kaga NLQ. Also usable are the Shinwa and other CP80 printers.

There are many more commands available with *UserDump*, and details are available by writing to Seran, Redwood Publishing, 141-143 Drury Lane, London WC2B 5TF.

R O M S

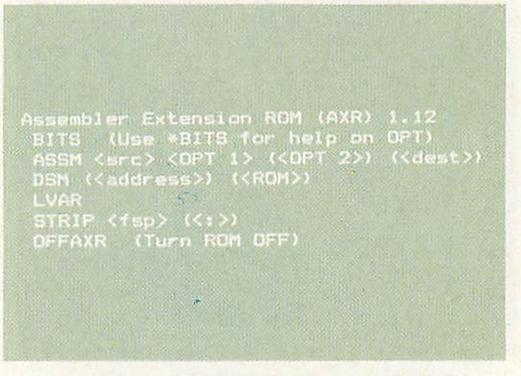


Your favourite Acorn User routines

BBC/B/ B+/M/ C/E Get *UserROM* for your favourite *Acorn User* routines. Plug in the ROM chip and 19 routines are instantly accessible via star commands, including colfill with 27 colourful fills; dotfill providing 23 new black and white shades; bad program recovery; variable lister; function key lister; a graphics compiler; a circle drawing routine and a sound compiler. There are many demonstration programs and a 22 page manual. All for £19.95.

Full details are available by writing to Seran, Redwood Publishing, 141-143 Drury Lane, London WC2B 5TF.

R O M S



Acorn User Assembler Extension ROM

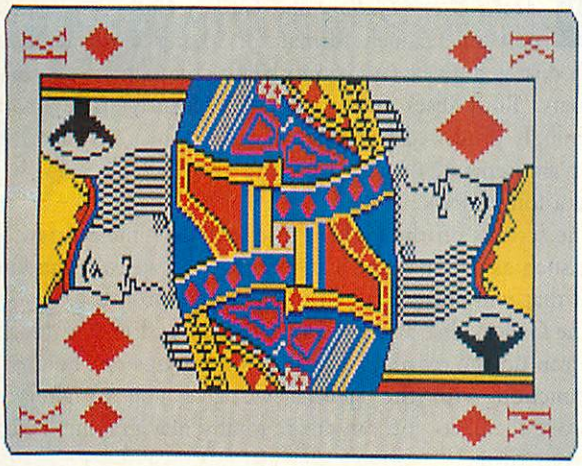
BBC/B/ B+/M/ C/E The *AXR* ROM, competitively priced at £19.95, is especially designed for use by machine code programmers. *AXR* adds a variety of options and commands to the Basic assembler, along with several new pseudo op codes, full Basic expression evaluation, and even the use of binary numbers. A disassembler is included in the software, and all 65C02 instructions can be used. *AXR* is compatible with Basic 1, 2 and Master.

Further details are available from Seran, Redwood Publishing, 141-143 Drury Lane, London WC2B 5TF.

Acorn User order form on page 130 – 24 hour telephone service (0672) 40825

OFFERS

PROGRAM LISTINGS



Mammoth monthly program listings

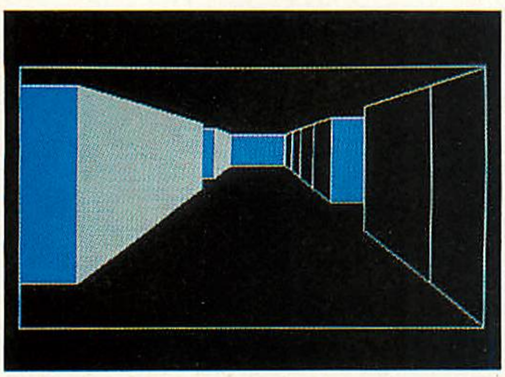
June's listings are dominated by Joe Telford's mammoth program which adds a fancy Gem-like front-end to your Master 128 or Compact. With the JOE program you can control your ADFS files using pictorial aids rather than awkard star commands.

This month's Hints & Tips from Martin Phillips is about partial screen dump programs that allow you to dump out graphics windows. Acorn Forum has provided two programs for June's listings; the first makes the transferring of fonts between *Pagemaker* and AMX *Superart* easy, while the second allows you to display mode 7 text even bigger and better than before.

We have a king-sized graphics bonus this month by computer graphics artist Paul Bayley, the King of Diamonds in glorious colour. There is also a surprise graphics bonus, by Rob Miller.

Having read this issue on home publishing you may like to know that the May 1987 listings contained the *Desalet* program which allows you to design you own typefaces for your publishing projects. You have probably already discovered how useful the *Acorn User* monthly discs and cassettes are, but did you know that the back issues are still available by using the order form on page 129? All discs are in 40 track 5.25-inch format with an easy to use transfer program for 80 track users.

LISTINGS



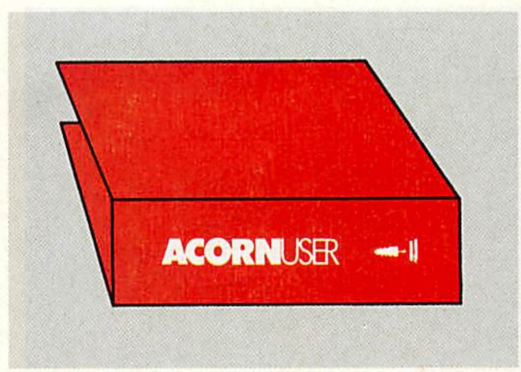
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OFFERS

GALLERY DISCS



Gorgeous screens with our Gallery discs

BBC/B/B+/M/C/E *Acorn User's Gallery* and *Gallery Collection* discs are now in 3.5-inch format for Master Compact users. Each disc is a giveaway at only £6.95, the same price for all formats. Both discs have over 20 brilliantly digitised and stunningly produced screens that will automatically scroll for your amusement, or you can load them all individually to have a longer look.

The screens on the *Gallery* disc include some old favourities, such as Thomas the Tank Engine, as well as some new ones that will amaze, tantalize and entertain you.

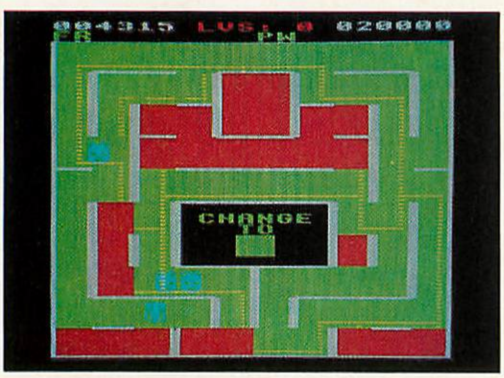
The Gallery disc also has *Super Painter* and *Pixel Editor*, so you can do the creating. These two programs can be used in conjunction with the screens we give you to alter and improve them, so you can create totally new graphics screens on your own.

The rich and the famous, or sometimes infamous, put in an appearance. Tony Hancock is on the *Gallery* disc, as is Max Headroom. On the *Gallery Collection* disc, Spitting Image and the Dallas crowd are in vivid colour in the company of Henry VIII, and everyone's favourite Bugs Bunny.

All the screens on the *Gallery Collection* disc come in compressed form with a programme to help you compress and expand your own screens, so saving valuable space.

Whether you choose 3.5-inch or 80-track or 40-track 5.25-inch format, you'll be getting great entertainment value.

CASSETTES



Games galore in our compendium cassette

BBC/B/B+/M/E You can guide Shuggy around his garden; puzzle over *Puzzle*, and be *3-D* amazed. Or destroy submarines with *Run Silent, Run Deep*. And for the really adventurous, go round the *Acorn User* office.

Best of all, try the truly different *Adventure* game written especially for the *Games Compendium* cassette by Rob Anderson. It's excellent value at £3.95.

You will also find David Acton's *Spectramania* and *Quadline* on this cassette: beat your micro, get four in a row. All are easily transferred to disc.

DISCS



Graphics utilities for your screens

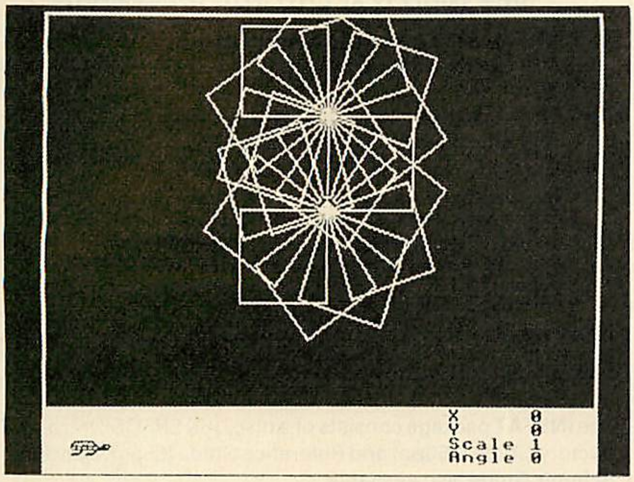
BBC/B/B+/M/C The 40-track 5.25-inch *Graphics Utilities* disc, keenly priced at £7.95, features 16 routines to manipulate blocks of graphics: rotation and reflection, a screen compressor/expander, a colour flood-fill routine and three mode conversion commands.

With the Basic procedure library are multi-height, proportional and justified text and 'drop shadow' boxes. A teletext screen editor gives point plotting, line drawing, rubber banding and flood fill, along with all mode 7 control codes. All can be used in your own programs.

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OFFERS

E D U C A T I O N



Easy learning with Education disc

BBC/B/ B+/M/ C The *Acorn User Education* disc makes learning easy and entertaining. The disc is packed with useful programs, including *Eco-Fax*, the sophisticated viewdata-type database for use on Econet systems.

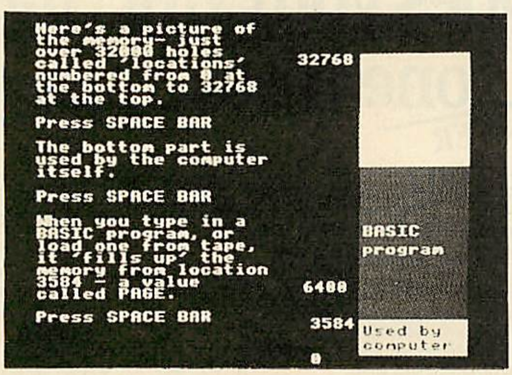
You can also have fun with the colourful version of *Turtle Logo*, the popular drawing program. Try plotting equations with Nigel Jennings' graph program.

Graphics programs are the feature of this disc and they include *Bulletin*, which converts your micro into an electronic message board. Strings of up to 255 characters can be screened in large colourful sideways scrolling letters. Create screens with the drawing program *Easyplot* and then use the two display programs *Vufoil* and *Noticeboard* to show them off. *Vufoil* acts in place of an overhead projector while *Noticeboard* builds and displays your *Easyplot* screens.

We have also included two screen dumping programs: George Hill's all-mode dumping routine for Epson-compatible printers may be incorporated into your own listings, and so may the teletext dumping routine which dumps in mode 7 to Epson FX80-compatible printers.

Our *Capitals* program will force all text into upper case. Budding Bachs can use *Tunemaker* to edit and play back their own masterpieces. This wonderful disc comes in 40-track 5.25-inch format only, but is easily transferred to 80-track. The *Acorn User Education* disc is yours for only £7.95.

D I S C S

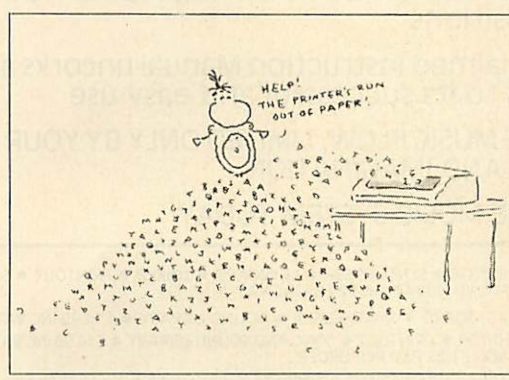


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D I S C S



Printer advice with Printer Help disc
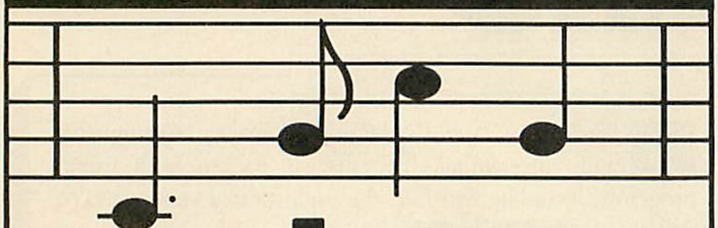
BBC/B/ B+/M/ C/E Often printer manuals don't fully cover the Master and BBC micro – our disc will help you to understand your printer's facilities for just £7.95.

The 5.25-inch *Printer Help* disc illustrates various print type styles, use of *Wordwise* and *View*, screen images and printer care. There is an ASCII standard codes table and clear diagrams illustrating stages of printer use including advice on what to do if things go wrong.

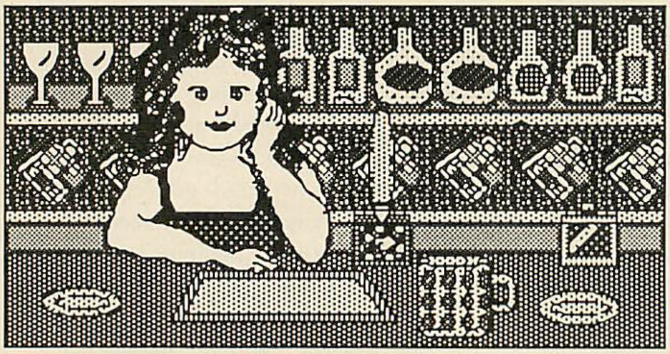
For compatibility details write to Seran, Redwood Publishing Ltd, 141-143 Drury Lane, London WC2B 5TF.

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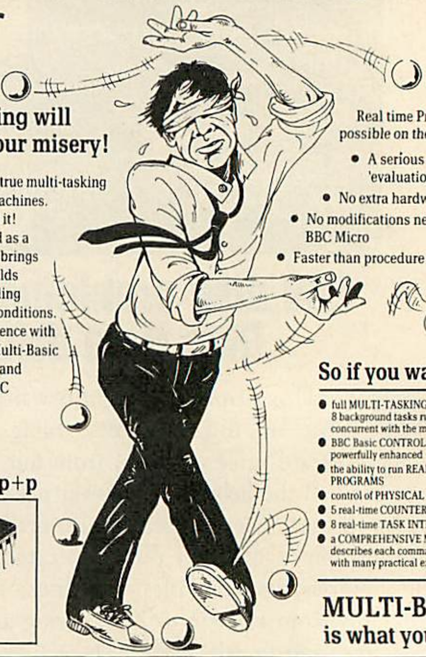
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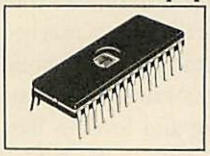
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REVIEWS

GAMES

THE GAMES PAGE

David Lawrence with releases to come, high scores, cheats, pokes and the promised *Sentinel* competition

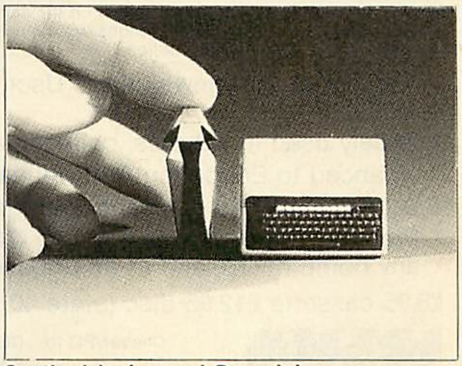
There's no rest for Repton. The miniscule megastar is on his biggest tour yet, taking in America, the Arctic, Africa, the Orient and the Oceans. There are Big Macs to collect and Indians to avoid in the Wild West. While up in the frozen wastes he's got to wrestle fish from the grip of polar bears and penguins. And all for the sake of his latest disc.

No, it's not *Repton 4*, more a sort of *Repton 3.5*, – *Around the World in Forty Screens* and it features another five sets of screens for *Repton 3*, much harder than the original ones and all the characters have been completely redefined.

The next main release from Superior should be *Elixir*, another *Citadel*-type graphics adventure. This time you have shrunk, Alice in Wonderland style, and arrived on a chemist's shelves. You desperately need to find the elixir that will return you to your normal size. The game features 40 screens and many logical puzzles including ghosts, bunsen burners and vanishing cream.

Audiogenic has another BBC game on the way. It claims that Gary Partis's *Daxis* will be 'The Game of '87'. There will be both Beeb and Master versions – the Beeb one will have to load data from disc (*Elite* style). The game involves not only mindless blasting but also a good deal of strategy. I think it will have to pretty hot stuff to be on par with Electric Dreams' *Firetrack* (reviewed last month), which is my current favourite 'nuke the aliens' type game.

As mentioned last month, The Games Page is running a special *Sentinel* competition. Peter Clements (who made the miniature BBC micro badges) has made some badges of the Sentinel himself (see photo) and has given us 12 to give away as prizes in the competition. All we want to know is the secret code for level 9999 and the answers to the following questions:



Sentinel badge and B model

1) Which three Acornsoft games did Geoff Crammond write?
2) Which film was based on Arthur C Clarke's short story *The Sentinel*?
3) If I had four robots and one tree energy, I absorbed a tree, created two boulders and a robot on top, teleported into that robot and absorbed the old robot, how much energy would I have left in boulders?

Send your entries on a post card to Sentinel Competition, The Games Page at *Acorn User*, 141–143 Drury Lane, London WC2B 5TF. The first 12 correct solutions drawn out of our hat on August 31 will win one of the badges.

To make the *Psycastria* cheat work, you need to enter ?&277=1 before loading the game. Then hold down ILTDN when you're at the title screen and enter SHOTOKAN as the password.

After reading the adventure help section in March, Keith Robinson comes to Jack Wasey's rescue! He says: 'To get past the guard to the forest king, you need to give him a treasure, such as a large cut diamond. You will then be given an amulet. This will be needed to rescue the princess. The forest king will then give you the silver key.'

Here is the latest high score table. I have had letters complaining about bogus high scores (*Pole Position* and *Castle Quest*), so I have reinstated the old ones.

Acorn User high score table

GAME	SCORE	NAME
Alien 8	28 lost	F Brown
Android Attack	149,105	T Hedger
Arcadians	98,020	N Islam
Aviator	30,450	P Hopgood
Battletank	117,400	S Gayler
Beach Head (B)	204,800	J Frue
Beach Head (E)	361,000	I Pierce
Boffin	582,155	I Surman
Castle Quest	2,240	P Simpson
Centipede	2,000,010	C Cochrane
Chuckie Egg	32,002,640	N Wright
Commando	417,600	P Sharrock
Contraption	993,200	C Cochrane
Cybertron	1,856,840	S Gelder
Danger UXB!	105,710	M Gullick
Eagle's Wing	112,700	R Schmidt
Exploding Fist (B)	397,100	C Parsons
Exploding Fist (E)	597,000	H Moore
Fortress	138,720	S Gayler
Frak!	20,000,200	P O'Malley
Free Fall (B)	5,024	P Comber
Free Fall (E)	7,605	I Jones
Hopper	63,104	N Brown
JCB Digger	131,450	S Concoran
Karate Combat	166,608	I Surman
Killer Gorilla	836,475	S Concoran
Match Day	16-0	J Freu
Meteors	498,500	P Ludgate
Missile	469,225	I Boffin
Monsters	283,000	S Concoran
Moonraider	642,125	S Concoran
Mr Ee!	1,415,500	S Roberts
Overdrive (B)	380,640	S Gayler
Overdrive (E)	1,130,700	S James
Painter	203,690	N Shaw
Pengo	312,900	S Killworth
Planetoid	3,186,450	S Concoran
Pole Position	110,000	P Gauagher
Repton 2	20,468	I Simmons
Revs (Oulton Park)	1:17.9	C Cochrane
Revs (Silverstone)	1:24.5	I Surman
Rocket Raid	168,010	S Gayler
Snake	1,395	P Simpson
Snapper	2,187,670	P Simpson
Space Adventure	4,890	M Bradshaw
Starship Command	8,420	I Boffin
Stryker's Run	16,100	P Sharrock
Thrust	1,054,450	T Simpson
Winged Warlords	336,000	C Dunn
Yie Ar Kung Fu	675,300	I Surman
Zalaga	29,329,420	S Gayler

And a special early *Firetrack* score of 324,000 by Bill Bauer. This was witnessed by his mum.

GAMES

TRACKING FORCE

Though it's bound to be compared with *Revs, Grand Prix Construction Set* is more of a game than a simulation, says David Lawrence

Grand Prix Construction Set; Superior; BBC B/B+/Master; cassette £9.95, 5.25-inch disc £11.95, 3.5-inch disc £14.95

When I put my Lego away last year, I thought I'd seen the last of model making and toy car racing. Now here comes Superior Software with the computer version of Scalextric (although they don't come out and say it). *Grand Prix Construction Set* isn't just another 3D race track simulation; it isn't as realistic as *Revs,* but is a lot more challenging than *Overdrive*.

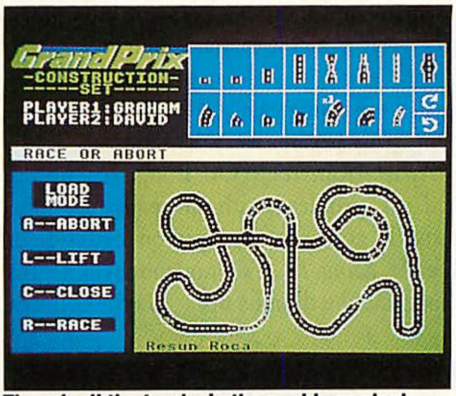
As the name implies, it is possible to construct your own race tracks, and this is where the game comes into its own. It's like having a bottomless box of Scalextric, and you can go way beyond the simple up-and-over figure of eight circuit. The other main feature is that two people can play at once.

On booting the disc, you are presented with the designer screen. You must first enter the names of the players and whether or not you are using joysticks. You are then given option of designing a new track, loading a saved track or selecting one of the 18 predefined ones. These include all the tracks from *Revs* and the one from *Pole Position* (Kyalami).

My first niggle comes when you try to load a track: you can only give six-character filenames. This is exceptionally annoying if you have two drives and you want to load (or save) a track on drive 1 in directory T. Typing ':1.T.' leaves you with only one character for the name. It would also be nice for it to be possible to display a disc catalogue.

Designing tracks is great fun and very easy. You first position the start/finish straight and then build up the rest of the circuit by selecting track pieces from the four different straights, six bends, chicanes and bridge. You can make the circuit as convoluted as you like and even cross over the track already present (although this is not shown as a bridge in the game). You need not link up fully: if you are facing the finish straight, pressing C will close up the circuit for you.

You can delete sections of track by pressing L, but on a long track this does take some time, as the track is redrawn. When you are satisfied, name the track and save it if you want to (although this is not necessary to play the circuit).



Though all the tracks in the world run clockwise, you can go the other way if you wish

My second niggle is that if any filing system error occurs or if you press A for abort, the whole program re-starts and you have to enter names again. It is also not possible to edit saved tracks.

Once you have selected, designed or loaded your track, the game itself loads. The screen is divided into mode 1 at the bottom and mode 2 at the top. The mode 2 is further divided into two 3D views of the track, each only a couple of inches high, but they give you all the detail you need. You are first asked for the number of laps (one to nine) and whether your opponent is human or one of the computer controlled cars. These range in skill from one (very easy to beat) to five (Nigel Mansell). On level one, the computer merely drives in the middle of the road; in higher levels he's harder to push around, and in level five he'll have a go at you. Two mini circuit plans are then drawn and the cars placed on the track.

This is where the split mode 2 is used – your yellow car races in the top window and your opponent's red car in the bottom. You can also see your opponent's car if it is just behind or not too far ahead of your car, and the same goes for him.

Your only controls are left, right, accelerate and brake. The cars are provided with a four-gear automatic gearbox, so you don't have to worry about that, and have a top speed of 240mph. The positions of the two cars are indicated by a block on the maps at the bottom of the screen.

As with *Revs,* cornering is the hardest thing to master. Each type of bend has a different maximum speed. Exceed it and you're in danger of skidding violently. Limits range from 112mph on a double sharp to 208mph on a banked bend. If you go over a hump-backed bridge doing more than 180mph, you're a goner, as you are if you hit the kerb at excessive speed or ram the other car. In any of these cases your car explodes and your opponent wins. Bridges and chicanes (which aren't real chicanes, merely narrow bits in the road) are depicted graphically, but unfortunately banked bends are not.



The 3D screens scroll smoothly, with each driver getting a view from his own car's tail

At the end of race, you get the chequered flag, and are declared the winner, if you're lucky. Another couple of niggles here. First, the other player is not given the chance to finish and so see the lap time. And secondly, the screen is cleared after a few seconds and the 3D view re-drawn so the maps are lost and have to be re-drawn the next time you play.

I like the game. The track designing is a great idea and the racing runs very well. If you can't join the elite who play *Revs,* or you want something superior to *Chicane, Pole Position* or *3D Grand Prix,* then Superior Software's *Grand Prix Construction Set* is for you.

REVIEWS

GAMES

KUNG FU 2 FOR YOU TOO?



Yie Ar Kung Fu 2; Imagine; Electron cassette £8.95; BBC B cassette £8.95, disc £12.95

It is twenty years since Lee, Kung Fu master, finally defeated the Chop Suey gang. However, one of the gang escaped, and has now returned under the guise of Yie Gah Emperor. He has recruited a gang of heavies and an army of midgets which have a tendency to bounce all over the place rather than walking. Lee Young, son of the original Lee, has come forward to challenge Yie Gah. You are Lee.

There are 24 screens, in groups of four. For the first three in each group, you must move across the screen to the left whilst fighting off midgets. After finishing the third screen, it's time to face the heavies.

In the case of the midgets, a single kick or hit will kill them. Not so with the heavies. In battle, you have an energy bar at the top of the screen, and each time your kick or hit connects with your opponent, his energy decreases. When this reaches zero he is dead. Unfortunately, you've got the same problem.

Lee is controlled by means of moving left and right, jumping and ducking. He can also kick and thump. Combinations of these can produce other effects – for example low kicks. As well as these standard methods, Lee has two techniques of his own: Chow Mein Noodle power and Oo Long Tea power. After killing a trio of midgets you get a tea leaf; after five leaves, hitting the T key at any time will put your energy back up to maximum.

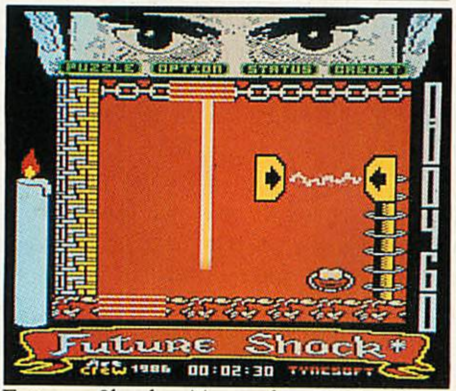
Unfortunately it seems tapping 'T' gives you tea on tap! A case of TOo Long Tea power, or maybe a programming bug.

The graphics are very good, with several backgrounds, such as caves, gardens and the water side. These and the sprites are well-drawn and colourful – the midgets actually spin as they summersault. Sound is adequate and there is a pleasant little jingle whenever a new Lee starts playing.

One small quibble: I found myself frequently pausing the game quite by accident. This became very irritating.

Apart from the TOo Long Tea power and the problem with the pause key the game is good, in my opinion better than *Yie Ar Kung Fu*. For my money I'd give this game the thumbs up. **Gavin Gillings**

SHOCK FAILS TO CAPTIVATE



Future Shock; Tynesoft; BBC B/B+/Master/Compact/Electron; cassette £7.95, disc £12.95

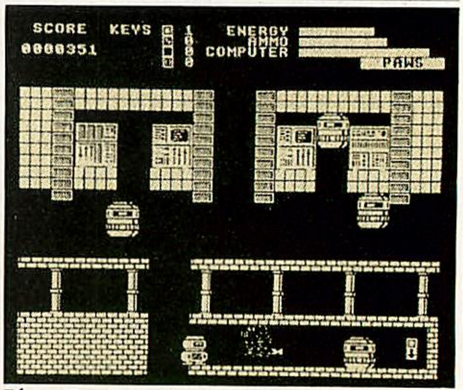
The job of evolution of human life has been sub-contracted to a bunch of drunken Maltrons, who manage to break up and scatter the scroll containing the plan of human evolution. Your task is to find the 16 pieces of the scroll and put them back together again using sliding blocks.

There are 64 screens. You have a candle to show you how much energy you have left, and this reduces rather quickly when you come into contact with any of the many nasties. Each time you collect a piece of the scroll your energy increases. I was very impressed by the pull down menus used to rearrange the pieces of scroll already found or to turn the sound and music on or off.

The game is graphically very good; when moving around the screens everything scrolls very smoothly. I found a few of the residents impossible to pass without some loss of energy, even if it didn't look as though I had touched them.

The copy I reviewed was a pre-production one which had no music and very little in the way of sound effects. When these are incorporated into the finished version it should give the game a little more atmosphere. The game is full of humour and was very enjoyable to play, although I found myself strangely unaddicted. **Joe D'Arcy**

B'S A BARGAIN



Plan B; Bug-Byte; BBC B/B+/Master/Electron; cassette, £2.99

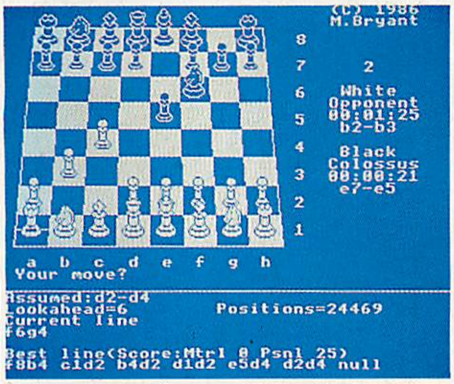
At first sight, *Plan B* from Bug-Byte is just another arcade-puzzle game. But I've played it for about a week now and discovered to my cost that it's very hard indeed.

The game itself is very well laid out with a high-score table and on-screen instructions. Movement; very smooth and the detail surprisingly good, although sadly the graphics are only in black and white.

The sound is a different story – a few laser effects and a boring explosion effect let the game down. Even worse is the little tune at the start which goes on and on.

This game is really just another *Jet Set Willy*. Our hero is sent in to destroy the parts of a computer and then escape. Lots of spares are conveniently left lying around and you pick these up for extra ammo or energy. As usual there is hitch. Other droids are out to stop you, and there are traps for the unwary: after going down one passage I entered the next screen and found myself trapped in a small box. In all, *Plan B* is a good little game that makes you think. And for £2.99 (on cassette only) it's a bargain. **Richard West**

CHALLENGING CHESS



Colossus 4 Chess; CDS; BBC B/B+/Master; cassette £9.95, disc £14.95

Martin Bryant, author of the *White Knight 12*, has another success on his hands with *Colossus 4 Chess*.

This review is based on the Master version, which is 64k of code, and has some very useful enhancements over the BBC B program. The game produces a detailed 3D image of the board and pieces (occupying two-thirds of the screen), though a 2D representation (which is what you get on the BBC B) may be chosen.

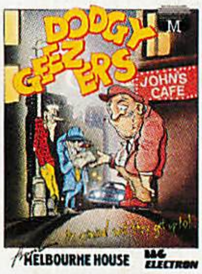
Colossus has an understanding of all the rules of chess and the Master version has an openings 'book' of 3000 positions, and thinks ahead while awaiting your move, which again speeds things up. You can turn off both of these facilities, making the game easier by reducing the computer's thinking time. All moves are stored in memory and you can step backwards and forwards. If you make a mistake you can step back through your moves and try a different line of attack – very useful for the beginner. All legal moves for any piece on the board can be displayed.

The most useful facility, however, is the saving and loading of data files. This allows you to save games and continue them from the saved position as well as viewing the 35 games and 10 problems supplied. These games were played between micro, mini, mainframe and human opponents.

The well-produced and informative booklet gives results from games against 21 programs running on various micros. Only six programs avoided a whitewash and none had better than 25 per cent success. I can recommend *Colossus* to anyone looking for a chess program that plays an excellent game at all levels. As a bonus the extra facilitates available for the B+ and Master make this a great package.

Ashley North

HONEST FUN WITH THE WIDE BOYS



Dodgy Geezers; Melbourne House; BBC B/B+/Master; cassette £8.95

Dodgy Geezers is a text-only adventure game with a sense of humour. It was written by Trevor Lever and Pete Jones who produced *Hampstead* and *Terrormolinos*. If you've played either of these, some of the characters in *Dodgy Geezers* will be all too familiar, but you don't need to have played them to be able to complete the new game.

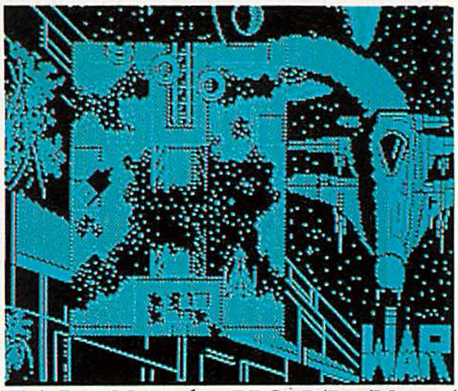
You play the role of a con jailed for supposedly taking part in the Long Ditton Spaghetti Caper. The truth of the matter is that you were framed. On being released you decide to try to keep to the straight and narrow. Some hope; soon all your old associates start hanging around and persuade you to organise a bank robbery. You have to decide which three of the unsavoury characters you meet will make the best gang to pull it off. Each of the characters has his own particular skills and drawbacks, you find.

The game was developed on the Quill adventure writing system, and input is in the form of verb-noun. Several commands may be placed on a line by separating them with the word 'and' as in 'get matches and go north'. *Dodgy Geezers* is loaded in two parts. In the first part you have to assemble the gang and in the second carry out the robbery. On the reverse of the cassette is a piece of music in the style of Chas and Dave which contains clues to the game.

It is refreshing to play an adventure with a novel theme to it and one that is not too difficult and yet not too easy. The replies to some actions can be very amusing and I found the game to be very enjoyable and well worth playing.

Chris Hunt

SAVE THE EARTH YET AGAIN



W.A.R.; Martech; BBC B/B+/Master/Compact; cassette £9.95, disc £12.95

In case you were wondering, the task here is to save the Earth single-handed by embarking on bombing raids in huge Droidan cylinders. These look like giant caterpillars moving through space! Progress is hampered by the presence of the Droidans who do not take kindly to your valiant efforts.

The game has some of the elements of *Psycastria*. First, the 'bomb the nasties to save the Earth' theme, and second, the screen, a mere three inches by five inches. Although small, the brilliant mode 4 graphics easily compensate. By the clever use of shading, detailed space stations and terrains are depicted using only two colours (black and blue – obviously how the Droidans feel after your raid!). In the harder version of the game, huge claws and eyeballs on stalks litter the cylinders.

Game play is good with four-directional movement of your spaceship over the screen. One word of warning though; it's possible to crash into buildings and ships that are just off the bottom of the screen, so try to avoid that area. To kill the aliens, just hold down the Return key (in a similar way to *Galaforce*).

After playing the game extensively, I can thoroughly recommend it. If I didn't have this review disc, I would not hesitate on spending the £12.95 asking price for my own copy.

One final point. Does anyone know what the letters in *W.A.R.* stand for? Perhaps it's a cry from people who would prefer sound on/off keys – what a racket!

Robert Miller



Master Builders

Many first-time buyers soon need more storage space. A craftsman-built extension from Torch Computers is the easiest way to open up the full potential of your BBC Master without over-extending your financial commitments.

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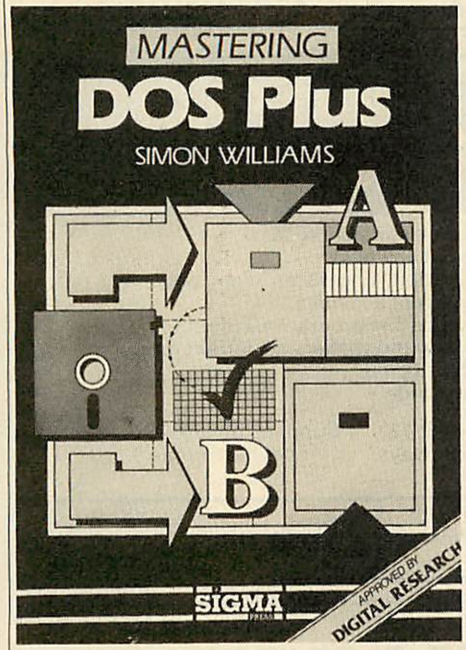
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BOOK

TEXT FOR TYROS

If you've bought a Master 512 board, this is the book to get you going. But it won't take you very far, says David Spencer



Mastering DOS Plus; Simon Williams; Sigma Press, 184 pages, £12.95

Following the recent £200 reduction in the price of the Master 512 board to £199 plus VAT, it is likely that many people with Master 128s will be tempted to buy this add-on rather than invest in a complete IBM PC clone like the Amstrad 1512. The advantage of a Master 512 over an ordinary Master is a very fast 16-bit second processor, 512k of memory, and – very importantly – the ability to run much of the software written for the IBM PC, assuming that the software doesn't use hardware calls for copy protection.

There are however problems upgrading to a 512, one of the major ones being the totally different operating system, DOS Plus. This is not the same as PC-DOS used by IBM, or MS-DOS used by most PC clones. It is in fact a combination of the better features of MS-DOS and CPM 86, a version of the popular operating system used on Z80-based computers, including the BBC Z80 second processor. So many of the books and self-study packages available for MS-DOS are of little use on the Master 512, especially for beginners who would have difficulty recognising differences between the two systems. *Mastering DOS Plus* by Simon Williams (published by Sigma Press) is one of the first books I've seen which is aimed especially at beginners on DOS Plus.

The book kicks off with a chapter on starting up a DOS Plus system and backing up the system discs. While this section does contain some useful information it is not written specifically for a Master 512 system, and you would be well advised to follow the details in Acorn's manuals rather than the book for this bit.

Chapter two starts to explain the commands available in DOS Plus by detailing the resident utilities, which are the commands that can be typed without having the system disc in the drive. This section is quite comprehensive, but again there are slight differences on a 512 which are explained in the 512's manuals.

The third chapter delves into the 'batch' languages of DOS Plus. For people not used to advanced operating systems, the idea of a batch language may be new. Basically, it is a very simple programming language, implemented by the operating system, with simple 'IF' instructions and input/output commands but not a lot else at all.

The idea is that it is possible to set up a file of commands in the batch language which can then intelligently start up several programs just by typing a single name. While all this is a useful feature of the operating system I can't see why it is described near the start even before all the commands have been explained. The chapter ends with a complete expert system written in the batch language; more of a novelty than anything else.

Next comes an explanation of the 'transient' commands which must be loaded from disc each time they are used. Unfortunately, the set of transient commands supplied on the 512 boot disc is not exactly the same as that of standard DOS Plus, so again it will be necessary to consult the Master's manuals.

To round off the view of the operating system, chapter five describes the file manager, a fairly primitive menu driven front-end for DOS Plus. Whether this is useful or not depends on whether or not you want to use the file manager, which I find more of a hindrance than a help.

Then the book moves away from DOS Plus and concentrates instead on the Gem and alternative input devices. Gem stands for 'Graphics Environment Manager', which means a version of the file manager that uses pretty pictures and a mouse instead of text and the keyboard. The Gem system bundled with DOS Plus includes *Gem Desk*, *Gem Write* and *Gem Paint*, all of which are described in detail. I found this chapter one of the most useful part of the whole book.

The next chapter looks at Locomotive Software's Basic 2, which a Gem-style Basic interpreter for the Amstrad 1512. As this system is only available for the Amstrad, the chapter will be of no use to the Master 512 owner.

The eighth and final chapter is titled 'How do you do?' and tries to answer common queries asked by beginners to DOS Plus, a job which it does well. The topics covered range from 'How do you format a disc?' to 'How do you stop the screen scrolling?' and 'How do I send data via the serial port?' Again, though, beware of differences with the Master 512. The book rounds off with a comprehensive glossary, and a not too good index.

Mastering DOS Plus is a good buy for the beginner who has just bought a Master 512, but should be read in conjunction with the computer's manuals. For the experienced user, or the programmer, I feel the book contains little material of use.

On the broader question of whether to buy a Master 512 rather than say an Amstrad 1512, I can't give the answer. Certainly if you already have a Master 128 with a *pair* of disc drives (the system must have two drives), I would go for the Master 512 upgrade, but if you are starting from fresh, with little knowledge of computing, I would suggest one of the true IBM PC clones.

HARDWARE

SIXTH SENSE

ESP's boards may only take eight chips – or six if you use Basic and a DFS – but Steve Mansfield argues that, with each holding a 32k chip, it's enough

With the mountain of chip-based software available for the BBC micro it's hardly surprising that one of the most popular add-ons is a ROM board, to allow you to plug in more than the five chips provided for on the model B.

There are many around, but a new product from Edinburgh Software Products (ESP) seems to have a lot to offer. It's small, inexpensive and gives you the option of adding extra memory.

There are two versions of the board, both of which are for the model B only. The ESP001 is simply for ROM chips, and takes eight of them. The more interesting version, the ESP002, is a combined ROM and sideways RAM board. Two 32k RAM chips can be fitted, plus six ROMs.

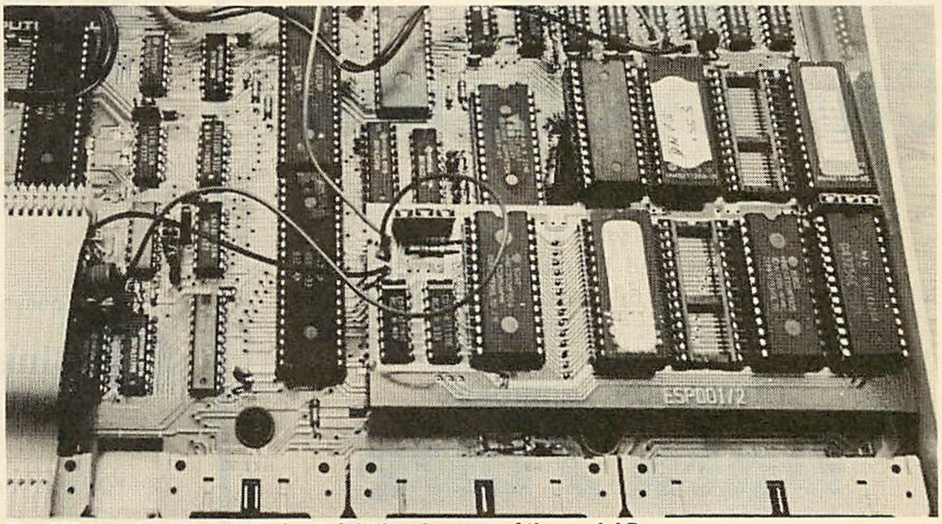
There is a slight complication here, which is important to bear in mind when comparing it with other ROM boards. As a rule, ROM boards give you extra chip sockets – you can still use the five sockets already in the machine. This product is different – the sockets in the micro must all be empty.

The average BBC micro will have an operating system (OS) chip, Basic and a disc filing system (DFS), leaving two spare sockets. On the ESP board, the OS chip goes into a special socket of its own, and the Basic and DFS chips go into the main sockets. So with the ROM board you have space for six extra chips, and four with the RAM version.

That may not sound like many, especially compared with boards that allow you anything up to 13 extra chips. But all the sockets on the ESP board are capable of taking 32k chips, each occupying two slots. That's handy if you write your own software and blow it into EPROMs.

If you have access to an EPROM blower, it is possible to copy proprietary ROM software into larger chips, providing you have permission from the suppliers. You can, for example, put the software from both of the 16k *Pagemaker* chips into a single 32k ROM chip.

This is true even with the RAM version. The two 32k chips can each take two 16k ROM images – that is, ROM software copied onto disc or tape. Software is provided with the board to load these images. So with the RAM board, your BBC B effectively has four 16k banks of sideways RAM like the Master.



The ESP board nestles in the front right-hand corner of the model B

But with the Master the sideways RAM is around the middle of the 16 slots. With the ESP board two of the banks are at one end (socket 0/1) and the other two at the other end (socket 14/15). This gives maximum flexibility. For example, if you load a wordprocessor into bank 15, resetting the machine will make it go straight into the program. If you want Basic first, load the wordprocessor into socket 0 or 1.

There are several links on the board which provide write-protect options. If they are set one way, software cannot access the sideways RAM, which prevents this being accidentally corrupted. It also overcomes the protection used by some ROM software, where the program writes to itself to see if it's in RAM, and refuses to work if it is. As a rule, copying software to disc and then running it in sideways RAM is piracy, and so illegal. You need permission from the supplier. Fortunately, many suppliers are now providing ROM software as disc-based images.

Installation of either version is simple with no soldering. First, remove all the ROMs from the five sockets at the front of the micro, and plug them into the board. The board then plugs into one of the sockets. Finally, attach flying leads (two for the ROM board and three for the RAM version) to the legs of some other chips.

How useful the boards will be depends on how you're likely to use them. Comparatively few people have EPROM blowers and will tend to plug 8k or 16k chips into 32k sockets. So the straightforward ROM version will tend to be underused.

The RAM version is a different story. Even with only four spare sockets (after inserting the DFS and Basic), I still have a couple left over. That's because all the software I use is in ROM images on disc for loading only when needed. For that reason this board rates as one of the best I've seen. The overall quality is excellent – well laid out and robustly made.

The ROM board, the ESP001, sells for £25 including VAT and postage, which has to be a bargain. The RAM version, the ESP002, costs £30 and the company can supply the RAM chips at £22 each. ESP will also upgrade the ESP001 to the ESP002 for £10. Finally, for £15 the company can provide 'smart sockets' which go between the RAM chips and the board, and provide full battery backup.

Edinburgh Software Products is at 1 Castle Street, Edinburgh. Tel: 031-225 3185

REVIEWS

GAMES

SCENT OF CEMENT

It may not be the world's most glamorous industry, but Michael Leete finds that cement manufacture is the basis of a thoroughly absorbing simulation

As part of its contribution to Industry Year 1986, Blue Circle Industries sponsored *The Cement Business Game*. It's based on the simulated operations of a small, independent and fictitious firm called The Goliath Cement Company.

Goliath is too small to influence cement market prices so is restricted to improving its market share to increase revenue. To do this, the company must keep its own house in order while giving such satisfaction to customers that orders flow its way rather than to the competition. All this takes place over a five year period within a pseudo-real economy taken from the years 1970 to 1985.

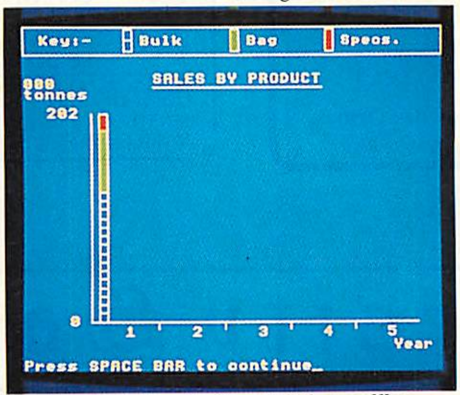
The game is intended for schools as a team effort, representing the board of directors. It may equally be played solo, but the cost may seem rather a lot for the single, domestic buyer, although the presentation of the game creates confidence in the product and suggests value for money (marketing rule 4.3 in the Players' Guide).

Playing could not be easier, so scores well in the Quinn Benchmark (in that executive whizz-kids do not have to bother to read the Players' Guide). The disc may be booted into instant action and text instructions appear on the screen before the first decisions in any area have to be taken. More pedestrian and cautious managers will read the book – a well written and interesting description of the game's relationship with real life.

The game proceeds in periods of 13 weeks. Each quarter, the board makes its plans in response to prompts by the computer, which then calculates the expected outcome. Once the plan is settled, the computer produces the actual outcome and cumulative results. Cost analyses and graphs may be inspected to form the basis for succeeding decisions. In the first quarters, this is rather a hit and miss process because the player knows something of the theoretical capacity of the plant but has no historical information on actual performance, accidents, breakdowns, delivery patterns and sheer disasters.

The biggest single snag is that events are a bit sudden. For instance, margins may be quite satisfactory in one quarter and negative in the next. Also decisions are irrevocable for the period and cannot be modified, as they would be if things started to go wrong. Nevertheless, a high degree of realism has been achieved without making the game too difficult to learn.

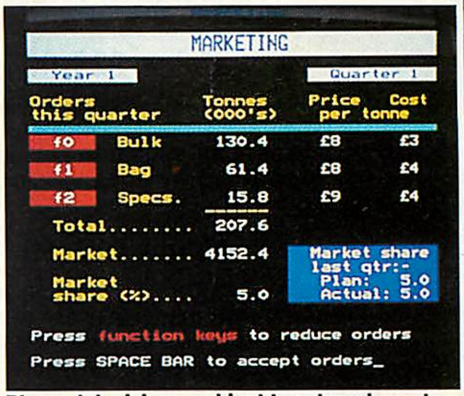
Anyone with computer experience likes to make back-up copies of programs and probably has a horror of using a 'systems' disc for current data storage. In the ordinary way, the game's disc cannot be copied and any breakdown or power failure could leave a number of files open with no means of closing them. Also it can only be suspended and saved at the end of each full year. It seems to me that this might be a major handicap in the classroom as, however absorbing the game may be, a dinner bell is a dinner bell.



Graphics lack imagination, but they suffice

The game would be easier if the order of approach to the main areas for decision could be altered. The first area is in marketing, where the orders received are either accepted or reduced. The trouble is that the player only knows the quantities that have been ordered and does not know which orders may be rejected with impunity. Is a customer loyal, slow-paying, awkward, or the best friend of a competitor?

I would also have liked a facility for printing hard copies of the figures. It could be that this omission is deliberate, to encourage the creation of monitoring systems which show the available information without having to refer back to it. However, my view is that print-outs would add to the realism and make it easier to take up an uncompleted session.



Players' decisions, subject to external events

Lastly, the quantity units in the case of stoppages for maintenance are actually wrong. This in itself is not particularly important, but the player has to be careful to watch the units since there is a substantial cost difference between ordering 50 tonnes of clinker and 50,000 tonnes.

In spite of the snags, the game is very playable and it turns out that cement is far more interesting than anyone would have imagined, dating from prehistoric quarrying. Although it is possible to play the game without getting hooked on the history, because the simulation is of marshalling resources to produce growth and profit, most players will certainly be left with a feeling that they would like to know more. And that, after all, is the foundation of education: an awakened curiosity.

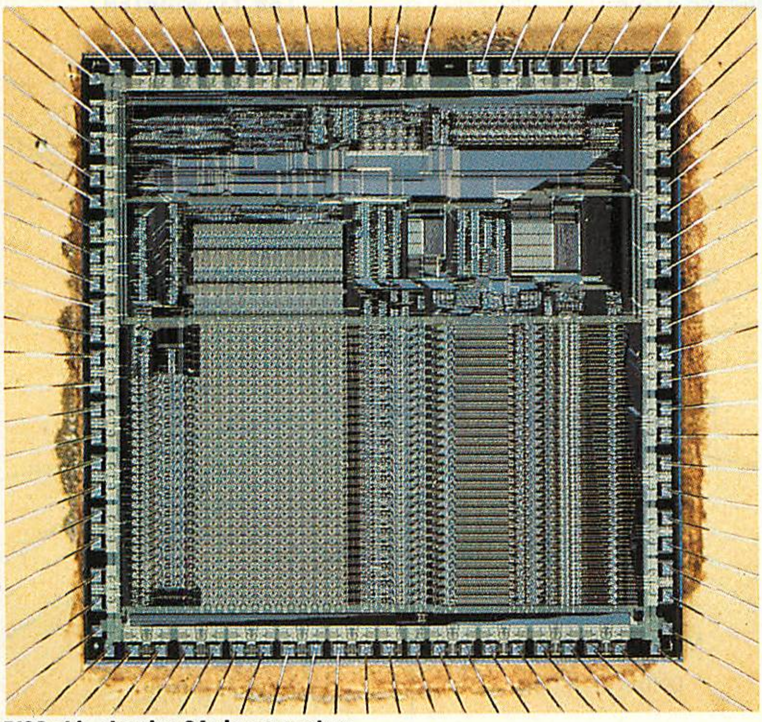
This game will never be a chart topper but in schools, particularly in the post-exam, end-of-term periods, it will provide an interesting and instructive entrepreneurial experience. At home, there is an absorbing fascination in trying to squeeze the last bag of cement out of the plant, deliver it to the customer and make a crust in the process. As an after-dinner alternative to Monopoly or Trivial Pursuit, company directors may be tested and a secret score leaked to head-hunters for a fee.

The Cement Business Game costs £35 inclusive from System Software, 12 Collegiate Crescent, Sheffield S10 2BA.

HARDWARE

ACORN'S RISC LEAPFROG

Often accused of being behind with technology, Acorn has just leapt ahead with a reduced instruction set computer chip. Peter Cockerell explains



RISC chip showing 84 pin connectors

One of the most exciting aspects of the computing industry is the chance for small companies to beat the giants at their own game – a kind of electronic David and Goliath struggle. In the early years of the microprocessor revolution, small new companies such as Apple flourished alongside the sleeping giants, IBM and Sperry. Now Acorn itself, with tiny resources compared with those of the giant semiconductor corporations of the USA and Japan, has scored a significant goal; it has produced an advanced reduced instruction set computer (RISC) on a single chip.

The Acorn RISC Machine, or ARM, is the microprocessor that lies at the heart of Acorn's future plans. This chip has so far only been available as part of a £4,500 evaluation package, but Acorn has also developed a range of support chips to control memory, video and input/output, so that the ARM can be built into future new micros.

So what is the ARM? Enthusiasts may already be familiar with RISC. The September 1984 issue of *Byte* ('New Chips') contained a brief description of the key concepts. It's worth looking again at these ideas together with the way the ARM uses them.

What aren't RISCs?

It is easiest to describe the RISC in terms of what it is not. It is not a 68000, 32016, 80286 or any of the other so-called 'super' microprocessors that are currently fashionable. These are all complex instruction set computers, or CISCs. The key feature of these chips is that their machine code is very close to the high-level languages they are usually programmed in.

The 32016 chip used in the Acorn Cambridge Workstation and 32016 second processor is a good example of a CISC. It was designed specifically to run Pascal and languages based on it, such as Modula-2.

For example, Modula-2 is a 'modular' compiled language, in which a program can be split up and written by several different people. A part of the program in one module can call a procedure in another module by 'importing' it. The 32016 keeps a special table of modules and an instruction CXP (call external procedure) for calling them. This corresponds directly to the requirement of the high-level language.

These super microprocessors are usually programmed in a compiled language, that is, when a program is translated once-and-for-all into machine code. This contrasts with the slower interpreted languages used on the BBC micro, where the program is read and translated each time it is run.

Because a CISC can directly execute the type of instructions needed to run a high-level language program, the compiler has an easier job. To a degree, this narrowing of the gap between the high-level language and the low-level instructions ultimately executed by the microprocessor has been successful. There are, however, drawbacks.

Complex shortcomings

First, by directly supporting high-level constructs such as those mentioned above, chips like the 32016 become very complex indeed. This makes them expensive and time-consuming to develop. Second, the

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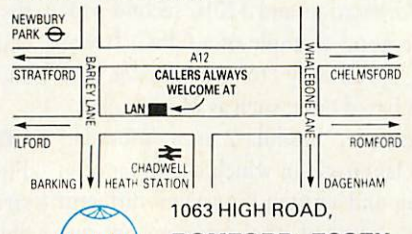
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instruction set becomes large and complex, with millions of combinations of instructions and the addressing modes that can be used with them. This too makes the chip harder to get working. Worse, the compiler which generates the instructions for the processor can usually use only a small fraction of the instructions, meaning that much of the effort that went into developing the processor is wasted.

Third, with the provision of complex addressing modes, CISCs can spend more time working out where data is than they do using it. For example, it is quite possible to have an ADD instruction on the 68000 in which the time taken to look up the operands is twice as long as the time taken to add them together.

Lastly, CISC designers frequently throw away much of the advantage of their 16- or 32-bit processing by making eight-bit bus versions of them such as the 68008 used in the Sinclair QL. This can have a crippling effect on the performance of the processor, as the workrate of a computer depends to a large extent on how much data can be transferred between the processor and its memory per second. Memory is often the slowest part of a CISC system, and if data is transferred back and forth in smaller chunks, the processor spends most of its time waiting.

These criticisms of CISCs do not apply only to the new super-micros. The same shortcomings can be noted in other types of computer, including the Vax family of minicomputers made by DEC. In one study of computer instruction set efficiency, it was shown that one of the very 'powerful' specialised instructions of the IBM 370 mainframe could actually be bettered in speed terms by using a short sequence of simpler instructions instead.

Another study has shown that running a typical program, a processor spends 80 per cent of its time executing a very small set of common instructions, and all the complex instructions are used very rarely.

The RISC alternative

Better, perhaps, to have an instruction set which has very few, simple instructions and have these instructions executed very quickly? Similarly, keep the addressing modes few and simple, so that operands can be fetched quickly (preferably from fast on-chip registers instead of from slow memory).

It was IBM itself that first researched a machine which departed from the trend of ever-increasing complexity, with a project at the Yorktown Heights Research Center in the mid-1970s. This led to their 801 minicomputer and the recent 6150 PC/RT (RISC technology) multi-user micro.

But the inspiration for the ARM came from elsewhere. A project at the University of California at Berkeley took the idea of a fast, simple computer and implemented it on a single chip, called RISC-I. Because of the relative simplicity of the design, a group of students working with design tools that were primitive by commercial standards were able to progress from initial conception to working chips in less than two years. A later chip, RISC-II, refined some of the ideas and techniques.

The Acorn designers were also impressed by the humble 6502 chip. A simple design, but faster in response to interrupts even than the super-microprocessors. Some of the key features of RISCs are mirrored in the 6502 chip.

Key concepts

The main features of a RISC are:

- Only a few simple operations – this makes the arithmetic section of the chip small and fast
- Regular chip layout to shorten development time
- Many general-purpose registers (16 on the ARM) so data can be held on the chip rather than fetched from slow memory
- Wide data bus (32 bits wide on the ARM) so that data can be fetched in bigger chunks
- Pipelining of instructions to maximise bus usage

The point about pipelining is vital. The idea of pipelining is to perform certain tasks in parallel, and on the ARM there may be up to three instructions in the processor at once: the current one being executed, the one after being decoded, the one after that being read from the program in memory. This makes things faster, because one part of the chip is rarely held up waiting for another part to do its task.

The hardware

The ARM chip has a 26-bit address bus and a 32-bit data bus, compared with 16-bit and 8-bit buses on the familiar 6502. This enables it to use up to 2^{26} or 64Mb of memory, organised into 16 million four-byte (32-bit) words.

The ARM chip in the ARM Development System is built using well-proven 3μm CMOS technology. Owing to its simple design, there are only about 25,000 transistors on a single ARM chip, compared with nearly 200,000 in a 68020. Because of its complexity, the 68020 is forced to use very advanced manufacturing techniques, so the ARM is much cheaper to make than the 68020 chip.

Now there is also a 2.0μm version of the ARM, making the chip at least ten times cheaper than current super-microprocessors. The smaller geometry should also make it possible to run the chip at higher clock speeds, raising its processing speed even further.

Software architecture

So what does the ARM look like from the programmer's point of view?

There are 16 registers, called R0 to R15, each 32 bits wide. These are all general-purpose, unlike the A, X and Y registers of the 6502. Whenever an instruction uses a register, any one of them may be used with equal ease.

Two of the registers, though, have special purposes. R15 is the program counter, holding the address of the next instruction to be fetched from memory. Because of pipelining, this is actually eight bytes ahead of the address of the currently executing instruction.

All instructions are exactly one word (four bytes) long and so are fetched in a single memory access, and are always aligned with word boundaries (the address is always a multiple of four). Only 24 bits of R15's 32 bits are therefore needed to address instructions (the two least significant bits of an instruction address being zero because of the word boundary rule).

The remaining eight bits of R15 are taken up by the processor status register. It might seem confusing that the PC and status register are in the same 32-bit register, but they can be treated separately by instructions where required. Having them in the same register has the advantage that when an interrupt occurs, to save the PC and status only requires one (internal) move-

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ment of data, as opposed to the two (external) required by the 68000 chip and similar processors.

Two of the flags are stored in bits 0 and 1 of R15, the other six occupying bits 26 to 31. Six of these are familiar NVZC flags (as on the 6502) which reflect the results of arithmetic operations, and two interrupt disable flags I and F.

The other two control the processor mode. The ARM works in four modes, normal (or user mode), two separate modes during interrupts (irq and fiq modes), and a supervisor (svc) mode reserved for the operating system.

Although only R0 to R15 were mentioned earlier, there are some other private registers which are only visible in non-user modes. These act 'in parallel' to some of the other registers. In fast interrupt (fiq) mode, R10 to R14 disappear, and five others called R10-fiq to R14-fiq take their place. This means interrupts don't have to save the old register information, and they can have their own data ready and waiting in the fiq registers. Irq and svc modes also have their own 'private' registers. Table 1 summarises these registers.

User mode	fiq	irq	svc
R0 – R9	R0 – R9	R0 – R9	R0 – R9
R10	R10_fiq	R10	R10
R11	R11_fiq	R11	R11
R12	R12_fiq	R12	R12
R13	R13_fiq	R13_irq	R13_svc
R14	R14_fiq	R14_irq	R14_svc
R15	R15	R15	R15

R15 is 24 bits of PC and 8 bits of status (N Z C V I F/S1 S0)
R14 is the link register
R13 is by convention the stack pointer

Table 1. The registers in parallel

When a non-user mode is entered, R15 is saved. It is actually just transferred to R14-fiq/irq/svc, as appropriate. From here it can be saved if R14 is needed for something else, or just left there until it's time to return. The return is performed simply by moving R14 back to R15 (maybe with some small adjustment of the program counter section of R15 if necessary). Because of this use, and another use described later, R14 is called the 'link register'.

These are the only special uses of the registers which are built in to the processor. Any register can be used as a stack pointer, although it is by convention R13 (which is why R13-fiq/irq/svc exist: so each interrupt routine can have its own stack).

The ARM instruction set

There are five groups of instructions on the ARM (table 2).

There are some generalisations which can be made about all instructions.

Group one, data processing on the contents of registers.

ADC	add with carry
ADD	add without carry
BIC	bit clear
CMP	compare
CMN	invert and compare
AND	logical and
EOR	logical exclusive or
MOV	move
MVN	invert and move
ORR	logical or
RSB	reverse subtract
RSC	reverse subtract with carry
SUB	subtract
SBC	subtract with carry
TEQ	test for equality
TST	test bits

Group two, single loads/saves

LDR	load register from memory
STR	store register in memory

Group three, multiple loads/saves

LDM	load registers from memory
STM	store registers in memory

Group four, branches

B	branch
BL	subroutine call

Group five, supervisor call

SWI	enter operating system

Table 2. The ARM's instruction set

Any instruction may be conditional. It means the instruction is only executed if a condition (like the carry flag being set) is met. Otherwise the instruction is skipped over. This is a very innovative feature of the instruction set which increases speed and reduces the size of program. A 6502 assembler may use the following code:

```
        CMP   #10
        BCS   over
        ADC   #7
.over   . .
```

On the ARM, the ADC may be made conditional, so there is no need to branch over it. There are 16 possible conditions which can be associated with any of the other instructions.

Most data processing instructions may be combined with a group of five shift and rotate functions at the same time. Therefore a number can be multiplied by five in a single instruction, by adding it to itself shifted left twice.

Group two instructions have two basic addressing modes, equivalent to the pre-indexed and post-indexed indirect modes of the 6502 processor, but these are very flexible because any register can be used as a base address, and another register can be used as an offset. The offset can be 'scaled' by a power of two, again using the built-in shift operations.

All instructions occupy one 32-bit word. Thus all instruction and operand information is available in only one memory access, speeding up instruction execution.

Instructions execute with real dispatch. The quickest, like adding two 32-bit numbers together, take one machine cycle – 125ns on an 8MHz ARM. The worst possible case is 2.75μs, which involves loading all 16 registers from memory.

Group one instructions involving no memory access can operate at a peak rate of up to 8 million instructions per second (MIPS). The only instructions that take more than one microsecond are store/load instructions of more than five registers. The average performance of an 8MHz ARM chip is 3 to 4 MIPS.

To give some comparisons, a 10MHz Motorola 68020 achieves 2 to 3 MIPS. The ARM runs most programs about 10 times faster than the 80286 chip used in the IBM PC-AT, and twice as fast as the frequently cited DEC Vax 11/780.

So what?

Acorn has got itself a high-performance chip – but what will it do with it? In the past, the company has committed itself to upward compatibility, which means any new micro will probably have the ability to pretend to be a BBC micro, and so run present software.

But the real challenge for Acorn is to take on the Amiga, the Atari ST and the Apple Macs. Will it? Can it? You won't have to wait too long to find out.

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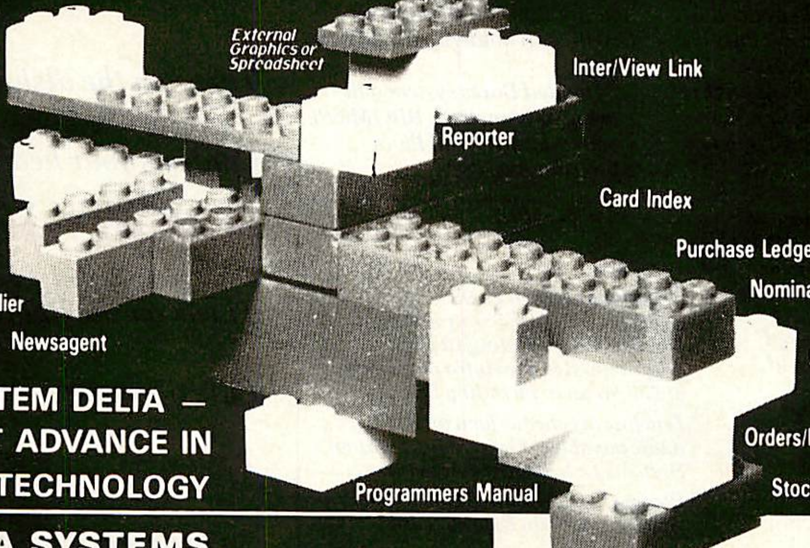
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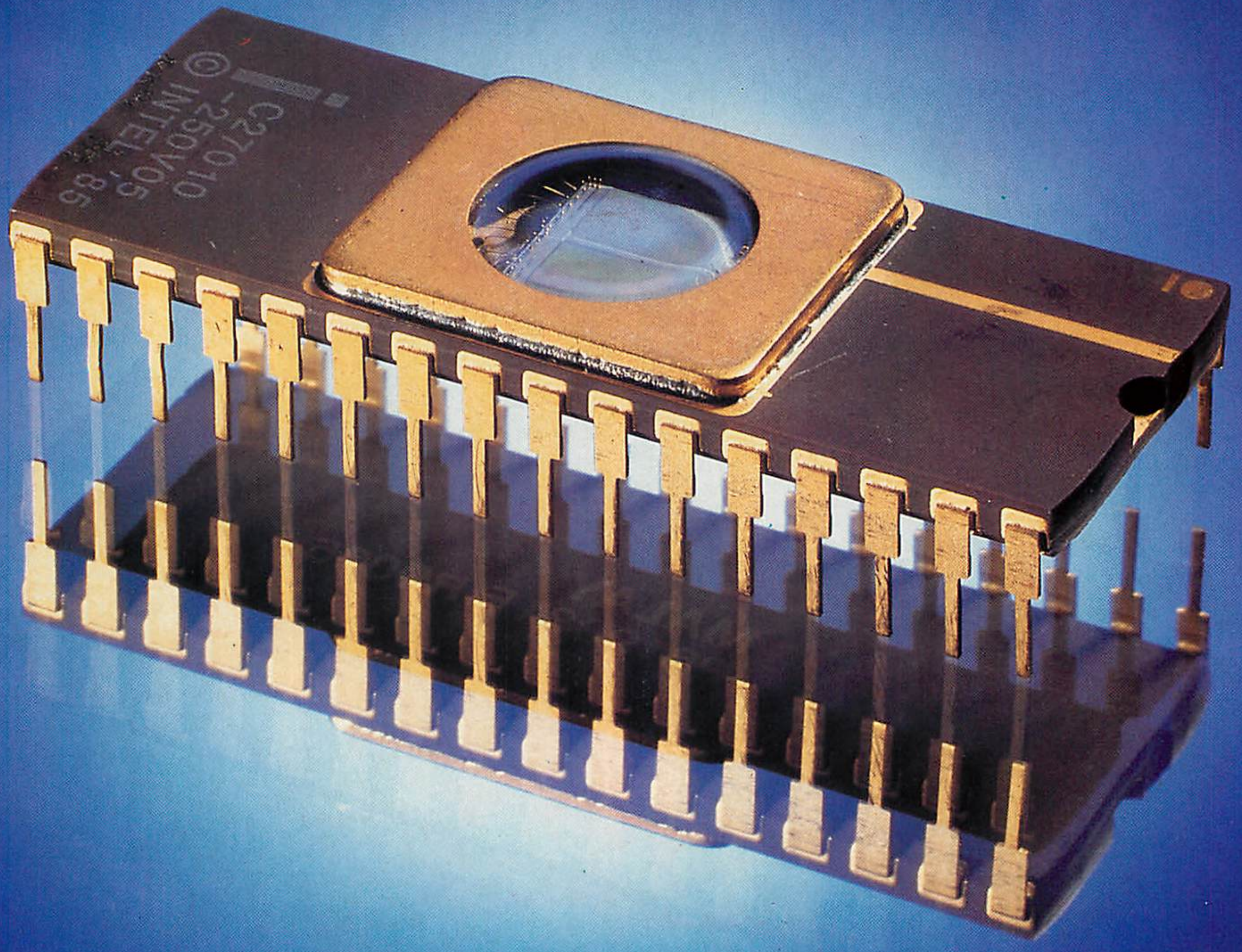
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SPELL-MASTER ROM

This is the first completely ROM based spelling checker in the world. As a result it out-performs all known spelling checkers on this machine or any other micro-computer. The single 128K EPROM contains over 59,000 separate words and 22K of program.

Compatible with all BBC Micros

Special switching techniques ensure that the 128K ROM appears to the machine as one single 16K ROM - this guarantees that it is completely compatible with the ROM sockets in all versions of the BBC Micro- computer.

Compatible with all the major word processors

SPELL-MASTER has been designed to fully integrate with the most popular word processors on the BBC, WORDWISE and WORDWISE PLUS, VIEW and of course INTER-WORD. While editing in these word processors all that is necessary to control SPELL-MASTER is to press one CTRL key (Usually CTRL-J). This causes a menu to appear listing a variety of options such as 'Check entire text', 'Check word at cursor', 'Continuous check - on/off' etc. Text is checked directly in memory while in the word processor. There are even short-cuts to the menu, for example, pressing CTRL-V in any of the above word processors will start checking the text immediately from the current cursor position. Compare this with the process of checking text in the most highly rated competitive product - VIEWSPELL.

VIEWSPELL	SPELL-MASTER
•Save text from word processor. •Enter spelling checker. •Load text into spelling checker. •Check the text. •Go back to word processor. •Load marked text. •...finally, make corrections.	•Press CTRL-V • make corrections.

Check entire text

In a word processor, SPELL-MASTER can check at up to 10,000 words per minute. Whenever a word is indicated as misspelt the user is given three simple choices. Replace the word with another selected from the dictionary, ignore the word altogether or add it to a user dictionary.

Check as you type

Because the dictionary is ROM based it is possible to check words as they are typed. This feature works with all the above named word processors and does not slow the operation of the word processor at all. Whenever an incorrect word is entered the computer will bleep; the word may then be corrected or simply ignored.

User Dictionaries

SPELL-MASTER supports extensions to the main dictionary in sideways RAM or ROM. This has the advantage that there is no speed degradation when checking against user dictionaries, since there are no disc accesses required at all. Once a word is added to a user dictionary it is treated as if it is present in the main dictionary.

SPELL-MASTER can support a number of separate dictionaries at once, each sideways RAM or ROM holding up to 3000 additional words. Once a dictionary has been created it can be 'burned' into an EPROM to form a permanent extension to the main dictionary.

Provision is made for editing any dictionary extension, for adding or deleting words in bulk, and directly loading or saving user dictionaries from or to sideways RAM.

Additional star commands

These can be issued from any language ROM such as spreadsheets or BASIC (they can even be included into BASIC programs). Some of the 8 commands are:

*CROSSWORD - Will search the entire dictionary for words that exactly fit the search pattern. For example *CROSS. ##M#U#ER would list ARMOURER, COMMUTER, COMPUTER. It takes about 8 seconds to check against all 59,000 words.

*ANAGRAM - Will list all the words in the dictionary that contain the same letters as those specified.

*FUZZY - Will list all words that sound something like the one you are searching for. If you are not sure of the spelling of a word then entering the approximate spelling here will generally list the word you are looking for.

Price: £59.00 incl.

Upgrades

Owners of the older two chip versions of SPELL-MASTER can upgrade to the single chip version for £25.00. However this new version is functionally equivalent and so it should not be necessary to upgrade.

2nd processors

Due to its unique design SPELL-MASTER will not work with word processors running on the 6502 2nd processor, although there are facilities provided for checking long text files.

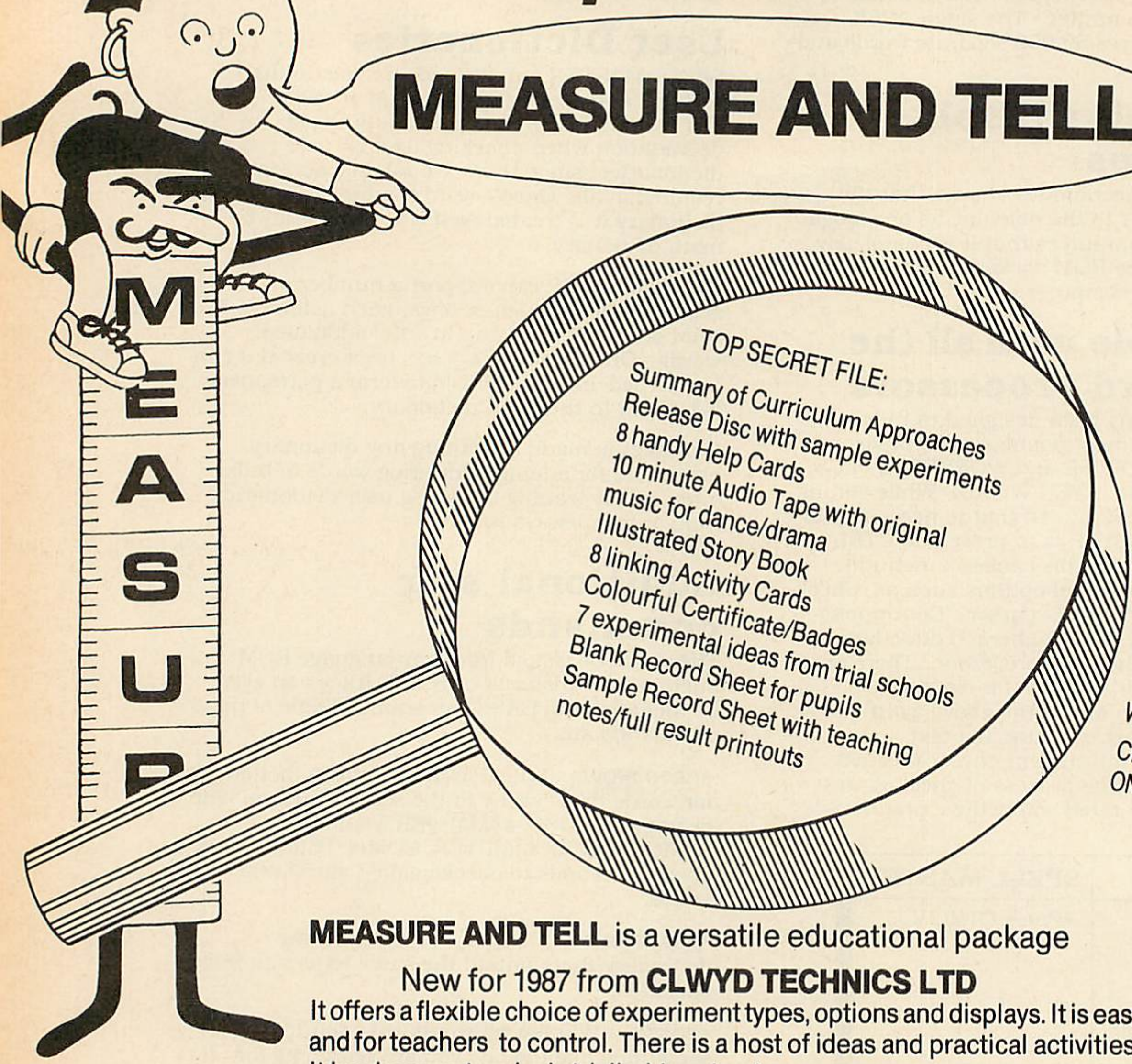
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EDUCATION

NEWS

Logo music

Logotron's *Music Logo* is a means to produce music using a Logo-style language. Created by Julian Pixton, it covers all aspects of the BBC machine's music capabilities but via a different language. The author sees Logo as a means to experimentation with music since it allows easy variation of rhythm, pitch and duration.

Present users of Logo may wonder how this new package differs from their normal Logo environment. The problem, as explained in the manual, is that Logo procedures are often irregular in execution because of the necessity for 'garbage collection' – the clearing of unusable space in the computer's memory. This of course makes rhythmic sequences impossible. *Music Logo* minimises this type of effect.

As with Logo, the primitives are simple and related reasonably closely to natural language. So, QUAVER, BREVE and so on designate the length of note which follows. SETCHORD uses two parameters to produce a chord based on the current voice and the two additional voices.

The manual introuduces the language by means of an informative guided tour.

The reference part is well laid out and straightforward. First-time users will need to use the package with Logotron Logo to understand the principles of Logo itself.

Music Logo costs £15 from Logotron, Dales Brewery, Gwydir Street, Cambridge.

Check your spelling

SpellMaster, the latest addition to Computer Concepts' armoury of ROM chip-based software, will be welcomed in a variety of educational institutions. It's a spelling checker which may be used with *InterWord*, *View* and *Wordwise*. It also has its own text editor which allows copy to be loaded in from other wordprocessors, to be checked and then edited.

The beauty of the package is its flexibility. It has a number of modes of operation. Checking can take place as text is being entered, faults being signalled by a beep. Larger files which will not fit into memory can be passed through the system and marked. A list of incorrect or unrecognised words is generated at the same time.

Other spelling checkers use disc storage for the additional words users add to the existing dictionary of 57,000 words. With *SpellMaster*, specialised terminology is stored in sideways RAM in user dictionaries. These operate in tandem with the main dictionary and, as far as the user can see, are fully integrated with it. So, when a user begins a wordprocessing



A versatile spelling checker

session, in addition to loading the wordprocessor itself, they will need to load the dictionary of additional words. In this form it may also be blown onto EPROM for a more permanent store in memory.

Educational users – both pupils and teachers – will find this package very useful simply for the checking of text for accuracy. Special needs departments will find that the package allows a child to browse through the dictionary to find the word which they need. And there is facility to allow the user to locate words of similar sounds and, hopefully, move on to the correct spelling of the word.

In addition, there are fun functions – for example, an anagram facility which will provide every recorded word comprising any string of letters and a crossword utility which will select words which match a given set of letters and spaces. And a wildcard facility checks all words beginning with a string of letters or containing given orders of letters.

The *SpellMaster* ROM retails at £51.30 and is available from Computer Concepts Gaddesden Place, Hemel Hempstead HP2 6EX.

Reading problems remedied

A new tool for the computerised analysis of reading problems has just been developed by MRH Software. *Miscue Analysis* is a package designed to help the teacher home in on specific miscues or misperceptions in the way a child processes the printed word. The authors are at pains to point out that miscues are not mistakes and that this package enables the production of reading profiles, guidelines for remedial work and provides space for records relating to up to 30 children.

Although this package is called an 'expert system' by the publishers, it really does not have the capacity to learn that a true expert system has. Nonetheless, it is a means of bringing the experience of an expert to bear upon the needs of children within a variety of classroom situations.

The package will also help to cut down on the routine record-keeping necessary in monitoring children's progress in reading.

Miscue Analysis is available for £15 from MRH Systems, 20 Highfield Road, Kidderminster DY10 2TL.

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NEWS

Improved school timetabler

Keith Johnson's timetabling programs mentioned in March have been further improved. The most significant change is a FIT command which automatically rearranges the timetable to accommodate problems caused by a misfit in the structure. This means that all possible variations may be examined and the most appropriate chosen, assuming that a solution is actually possible.

In fully automatic mode the program will seek out the simplest musical chairs arrangement before going on to compile the entire timetable!

Computerised administration is being closely looked at by authorities. Some are interested in providing not only computerisation to span the whole office structure, but also links to regional offices.

Computer and information technology co-ordinators might be pleased to see the implementation of new technology in an area over-burdened with paper administration. However, they could be concerned that the computer person in the school would be expected to manage the system.

The major unanswered question is whether schools will not look unkindly on IT staff who refuse to handle the new equipment, albeit in response to LEA guidelines. If Mr Smith in the office gets stuck, is it politic for a teacher with computer expertise to refuse to try and help? Even with widespread retraining of staff and provision of LEA trouble-shooters, there will be a considerable time-delay in providing expert advice and backup.

Keith Johnson, 128a Urmston Lane, Stretford, Manchester M32 9BQ.

Logotron Pendown and Logo extensions released

Logotron has released two extension packages – one for the *Pendown* wordprocessor and the other for its Logo.

Pendown Toolbox comprises five separate utilities designed to make life easier with the *Pendown* package. Twelve fonts provided with the package come in three sizes: small – including Times, Old English and Shadow, all of which may be printed into 40 column width. Medium – comprising Block and Futura which are 20 column fonts and large – comprising Relief and String fonts, both of which need 10 columns per page.



The basic *Pendown* package

The medium and large size fonts from *Toolbox* – or those provided with the utilities disc – may be used with the *Pendown Signwriter*, which allows the user to produce long signs by printing words lengthwise on the paper. The page on screen scrolls sideways, allowing the user to create a sign, which is limited to eight lines in depth. The sign may be up to 255 characters wide with a facility to centre text.

The ability to create new fonts provides an added dimension to wordprocessing. Children now have the chance not only to present the text in the form that they think is best but also actually to design the character set which is used. Often, this process may be achieved by editing existing character sets. In this way designs may be used which are appropriate to the type of writing that is being presented – spooky letters for a ghost story or computer print for a science fiction story. The editor is straightforward to use and gives simple access to all the user-definable characters in the machine.

For the teacher, the wordbank facility allows the addition of new words to a number of children's dictionaries without having to repeat the same entry process over and over. A file of words is created and any group of words from that file may be added to a dictionary in one go. Each group may comprise words up to a total of 2816 characters, or about 470 words in total.

Also for the teacher there is a !BOOT file generator. The !BOOT file is the initialising file which operates when the user presses the Shift and Break keys together. The teacher can create this to set up *Pendown* for page width and length, tabs, printer status and so on.

Toolbox costs £15 and is available from Logotron, Dales Brewery, Gwydir Street, Cambridge CB1 2LJ.

HMI's MEP report favourable

The recently published report by Her Majesty's Inspectors on the work of the Microelectronics Education Programme has provided a direct vindication of the policies of its successor – the Microelectronics Education Support Unit.


MESU's director, John Foster

Although critical of some aspects of MEP's operation, the overall impression of the report is that a great deal was achieved. The policy of centralised information provision, development of support materials for existing software and the movement towards the cross-curricular integration of IT are all aims espoused both by the report and by MESU.

MESU is removing the worry that some observers had that there would be little in the way of local initiatives, developed with national funding, by means of an imaginative and wide-ranging scheme of fellowships relating to specific approved projects.

The committee has been swamped with applications and is no longer considering any unsolicited proposals. It is hoped that with the tighter rein on development a more stable research policy will emerge that will build on the exciting – if diverse and amorphous – developments that took place under MEP.

MAPS AND MORE

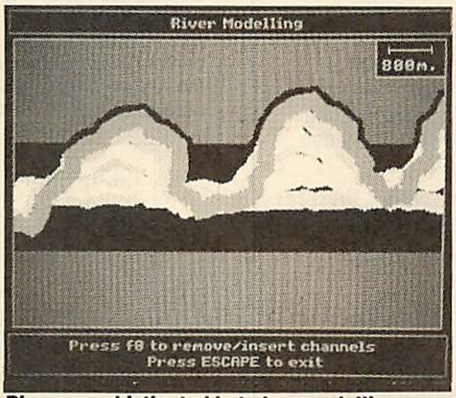
Geography is more than grid reference packages, with modelling and systems programs to build on field work

Nick Evans

Continuing our look at the humanities subjects we now turn our attention to geography. As with any subject into which you wish to introduce computer programs, it is important to know what you intend to achieve and whether the computer is going to be able to help. Most subjects have suffered from a surplus of software relating to topics which are easy to transfer into computer form, whereas there tends to be a dearth of programs which follow a more open-ended 'tools' approach.

Geography is no exception. A glance through software lists will reveal numerous examples of 'grid reference' programs and yet little in the way of modelling or theme-related simulations. Consequently, teachers new to the use of computers in the subject are more likely to encounter the grid reference type programs and assume they represent the sum total of the computer's contribution. This is not intended as a condemnation of grid or any other commonly programmed application. There are good examples – usually those which actually relate the work to another area at the same time. So, for example, Soft-teach Educational's *General Map Reading* applies the principles that appear in many other programs to interpreting Ordnance Survey maps. The meaning of symbols, orientation, compass direction and the ability to follow symbolic references to an objective, all form a part of this interesting pack and its successor, *Coastal Map Reading*. Other packages with a similar idea are *Mapwork (Britain and Ireland)* from School Software *Introducing Map Skills 1 & 2* from Cambridge Micro Software and *Maps and Landscapes* from Chalksoft.

This type of material is fairly universal in its usefulness. It sits equally comfortably in the primary topic-centred lesson as in the secondary geography syllabus. The only factor governing the use of such material is the way the teacher uses it. With a primary class there is little problem. The child's work is varied and usually part of a group effort. In addition the group work is part of a greater whole. In the secondary classroom however, the more formal atmosphere and



***Rivers*: sophisticated but clear modelling**

the problems of getting hold of equipment may preclude the occasional use of the computer and appropriate software.

For that reason, this article, as with others recently, will suggest a developmental approach to the use of the micro in geography. However, there is little likelihood of a strict development plan ever being worked out between a secondary school and its primary feeders solely with relation to geography and computers. Yet certain fundamental skills will be developed at the primary phase, which can then be built upon in the secondary school. Taking our example of the map work, the primary school which gets those principles sorted out clearly allows the secondary school to develop more effectively with packages which draw on skills already encountered.

A subsequent development by the secondary school, specifically related to computer software, might be the orienteering program, *The Forest*, from Cunning Running Software. This draws on a wide variety of skills to reach a destination. Since the landscape presented is almost featureless, more subtle clues must be used to discover direction, orientation and the lie of the land. As the program develops, so the use of geographer's tools such as cross-sections and contours are brought into play to make sense of the surroundings. The package assumes a knowledge of bearings, grid-reference and other fundamental map-reading skills.

The beauty of an adventure or simulation such as *The Forest* is that it brings to life situations which are generally not readily available, other than on field trips. Although an enthusiastic junior geographer may be able to retain his motivation when studying theoretical cross-sections most children are merely going through the motions. Given a chance to explore a situation where those skills come to life, the child is not only more likely to enjoy the work but also more keen to learn.

One pack which provides a variety of good examples of computer situations is *Introducing Geography* from BBC Soft. This tackles contours, planning an ascent of Mount Everest, ensuring the survival of a nomadic cattle herd and planning a flight path all in one package! Well worth a look.

Adventures and simulations are really distinct types of software, often differentiated falsely by the assumption that a simulation is factual, whereas an adventure is not. Adventures tend to be more exciting in that they introduce an element of fantasy or put the user into more contorted situations than do simulations. The simulation is usually understood to be a program which takes a real-life situation and transfers its decision-making elements to the computer for the user to undertake. *The Forest* seems to combine both these elements. However, packages like Heinemann's *Exploration* approach the theme from a much more light-hearted and junior-orientated direction. In one of its elements the player is trapped inside an ancient tomb with only a compass and a mysterious map to help find the treasure, and the exit. The inspiration is more in the child's mind than on the screen. The situation is set by the computer, and the rest is up to the child. The teacher's input at this stage should not be forgotten. A good teacher will have built a foundation for the child's imagination to work on and, after using the program, will be able to capitalise on the child's experience. This approach tends to be in the minority as most programs for geography are either straight teaching programs or simulations.

As examples, the various programs from Storm Software and Fernleaf are typical. Storm produces *Flight Path* and *Search and*

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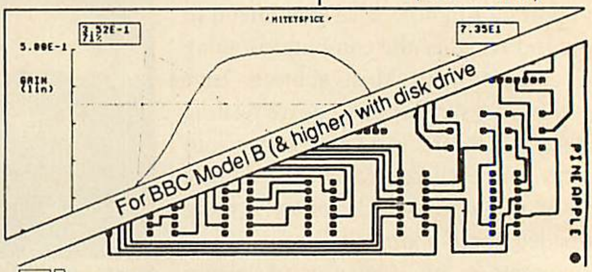
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Rescue which simulate planning and plotting the course of an airliner and planning the rescue of a stranded yacht respectively. Both use similar techniques in that not only are the elements relating to geographical location dealt with but also all variables to do with fuelling, the type of craft and the proposed route, taking into account climatic conditions. (*Flight Path* was reviewed in *Acorn User* November '85.) The important thing as far as the pupil is concerned is to get the planning correct at the beginning – if the theory is flawed, then, just as in real life, the outcome will be wrong. The Storm Software programs provide a teaching unit to help with each phase of the operation and it is then possible to analyse the faults in relation to a specific theory.

Fernleaf Software has also produced a variety of simulations which fit into the general humanities/geography area. *The Sea* and *Roads* packages present problems relating to planning, decision-making and management. These seem to be advanced tasks for primary children and, in isolation, these programs would probably prove to be counter-productive. The teacher must first build a firm base of knowledge from which the child may work.

To take an example from the packages, which each contain four programs, *The Bypass*, which is part of *Roads*, simulates the need to create a bypass around a town whose roads have become congested. The user may draw on a variety of information including an examination of the various types of traffic, heavy lorries, shopping, school travellers, and so on. Using this information and map supplied the child or, more ideally the group, plans a route to bypass the town. Financial as well as geographical and political constraints have to be taken into account and, at the end of each session, a group's effort is assessed by the Minister. The best thing about such a program is that there is no right answer. There are many possibilities which the children can explore.

Similar packages are *The Fishing Game* and *Rainbow River* from Cambridge Micro Software. The first is a straightforward simulation of the constraints placed upon fishermen in their trade, both at sea, and on shore selling the fish. The second is an environmental pollution program in which children are encouraged to minimise the impact of industrialisation upon the environment. A number of other software houses produce this type of package although many have a variety of curricular strands to them – Cambridgeshire Software House's *Town* and *Police – Language in Evidence* are good examples.

Finally, the simulation grows up and expands – the end result is the dynamic modelling program. In our developmental pattern this is the top of the tree since it is an advanced form of the simulations which involve decision making. Rather than progressing through the package, taking into account variables as they come and then arriving at an answer, the user is able to have a much more flexible control over the computer environment.



Search and Rescue **: save a stranded yacht**

To explain, it would be a good idea to look at a package such as *Rivers* from Granada Television under the Geography Today logo. This sophisticated package allows the user to create, examine and modify river models on screen. This is achieved by the use of data files, either those provided with the package relating to the rivers Derwent and Brathay or by collecting and storing data from field work, using the program's data handling system. Statistical facilities are available for analysing the data as well as a dynamic modelling simulation which plots sample output to screen during the running of the program. This professional program is not designed to be used lightly or as a quick dip in and try it type of package. It has been developed for a serious purpose and presents a very complex subject in a clear manner.

BBC Soft also produces a pack of four programs which allow this type of modelling. *Advanced Studies Geography* tackles traffic analysis, shopping and settlement patterns, drainage basins (based around the River Derwent again) and industrial locations – a topic that has been tackled by a number of software houses. It comes with extensive documentation and is supplied on cassette to keep down costs.

So the whole range of possibilities may be seen in the software available. Planning and forethought by schools in co-operation with each other can mean that techniques that have been mastered in the primary sector using the computer may be built on in the secondary. The range of software available is much greater than the few packages mentioned here. Notable by their absence for example are Michael Jay Publications whose *Earth Science* series tackles a wide range of geographical and geological topics at an advanced level. The important issue for the geographer in the classroom is that the skills and experiences which are necessary for understanding the principles of geography should be provided by the software. If not, then chalk and talk may well be more effective.

Even the best software can only at best augment 'real' field work. A final note which will hopefully be helpful – a MEP publication entitled *Exploring Geography with Microcomputers* gives a wealth of information on packages and principles.

Program *General Map Reading, Coastal Map Reading* **Supplier** *Soft-teach Educational, Sturgess Farm House, Longbridge Deverill, BA12 7EA.* **Price** *both £23*

Program *Maps and Landscape* **Supplier** *Chalksoft, PO Box 49, Spalding PE11 1NZ* **Price** *£17.50*

Program *Mapwork (Britain and Ireland)* **Supplier** *School Software, 69 Meadowvale, Raheen, Limerick.* **Price** *£17.95*

Program *a) Rainbow River b) The Fishing Game c) Introducing Map Skills* **Supplier** *Cambridge Micro Software, Edinburgh Building, Shaftesbury Avenue, Cambridge.* **Price** *a) £14.50, b) £17.50, c) £17.50*

Program *Exploration* **Supplier,** *Heinemann Windmill Press, Kingswood, Tadworth KT20 6BR.* **Price** *£36*

Program *a) Roads b) The Sea* **Supplier** *Fernleaf, 31 Old Road West, Gravesend, Kent DA11 0LH.* **Price** *both £35*

Program *Rivers* **Supplier** *Granada Television, Mercury Music, PO Box 194, Sevenoaks, TN15 8TZ.* **Price** *£19.75*

Program *a) Introducing Geography b) Advanced Studies Geography* **Supplier** *BBC Soft, Woodlands, 80 Wood Lane, London W12 0TT.* **Price** *a) £20, b) £12.65*

Program *The Forest* **Supplier** *Cunning Running Software, 11 Avon Buildings, Flower Lane, Amesbury, Wilts SP4 7HF.* **Price** *£15*

Program *a) Search and Rescue b) Flight Path* **Supplier** *Storm Software, Newbury Court, Gillingham SP8 4QX.* **Price** *both £20.30*

Book *Exploring Geography with Microcomputers by Deryn Watson, £9, from Council for Educational Technology, 3 Devonshire Street, London W1N 2BA.*

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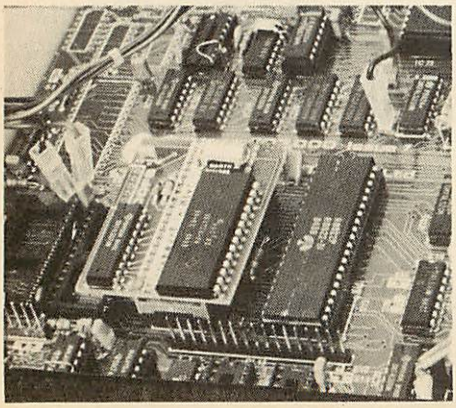
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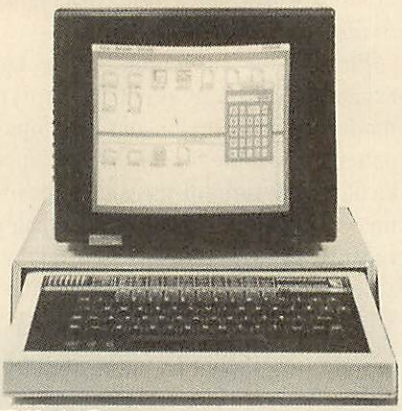
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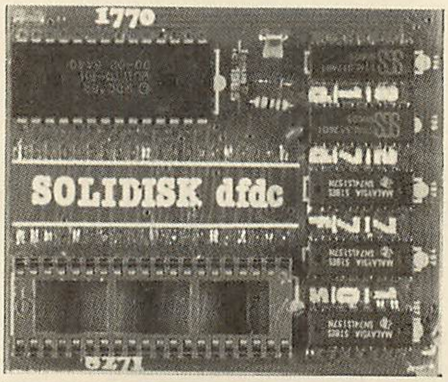


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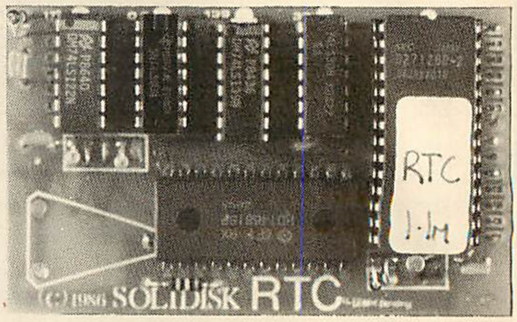
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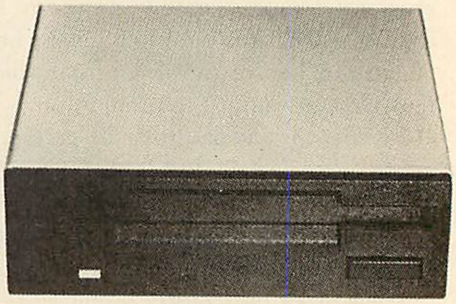


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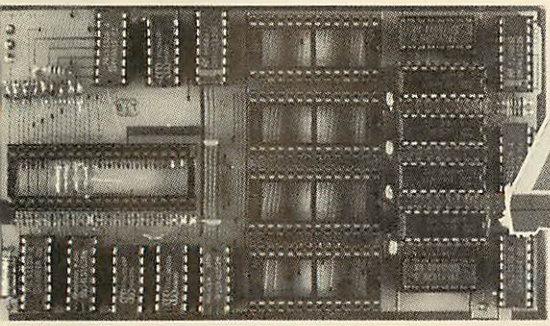
PLEASE SPECIFY SWITCH/MASTER/COMPACT/ ELECTRON if applicable.



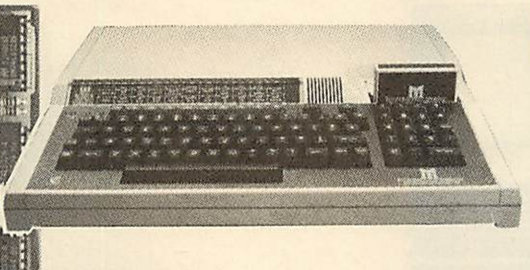
SOLIDISK TECHNOLOGY LIMITED, 17 SWEYNE AVE, SOUTHEND-ON-SEA, ESSEX SS2 6JQ. TEL. SOUTHEND (0702) 354674 (16 lines).

RISE YOUR BEEB!

Solidisk Technology



TWOMEG 128



MASTER 128

New: The Twomeg 128K board

Solidisk has always been closest to emulate the MASTER 128K. The Twomeg 128K features 64K of Sideways RAM in four banks: 4, 5, 6 and 7, selected by a single latch at &FE30 for both read and write exactly like the Master. The remaining 64K is more versatile and can be used as four more Sideways RAM (12, 13, 14 and 15) or as Shadow RAM and a 24K printer buffer (good news for wordprocessor users).

The new Twomeg 128K will run Computer Concepts Interword, Sheet and Spellmaster, Acorn View 3.1, Viewsheet, Viewstore, Basic etc.
A clever switch write-protects only the 8 banks of Sideways RAM without affecting the Shadow RAM and the Printer Buffer.
Ramdisk is not forgotten, you can have one in ADFS (if you have Solidisk ADFS) or in DFS for both 8271 and 1770 disc controllers.
Four extra ROM sockets are available directly on the Twomeg 128K board, numbered 8, 9, 10 and 11. Four ROM sockets on the Beeb are renumbered to 0, 1, 2 and 3.
Software is supplied on FIVE discs, containing Wordprocessor, Spelling Checker, Database, Macro Basic, Ramdisk, Menu, Manager etc. Software Pack 2 (five discs) is optional and contains many useful utilities for the machine code programmer. Software Pack 3 also optional, contains around 50 of Solidisk Megagames. List of all programs in these software packs is included in the Twomeg 128K User Manual.
Fitting is extremely easy: just plug in the board into the CPU socket and push 3 terminals onto S20, S21 and S22. Internal logic produces chip select for the &FE30 latch. Free installation by local experts is available.
Order as 2MEG128 .... £60.00

PLEASE SPECIFY /40 TRACK OR /80 TRACK FOR THE SOFTWARE PACK 1, included in the price.
Optional software Pack 2 or 3 (five discs) £10.00

Detachable Keyboard and CPU case:

This 'three box' casing system will help you to organise your desk and improve comfort. The keyboard features the lowest profile (maximum height of any key is 47mm) and does not skid. Typing angle is 2-3 degrees better. The monitor sits on top of the computer. Pure metal construction provides EMF shielding against phantom keyboard interrupt and accelerates heat dissipation (no messy metal strengthening over plastic). Keyboard lead is 24" long.
Order as K/CPU case, special offer price while stocks last £25.00
Note:
Post and packing £6.00



The Fourmeg 32K board:

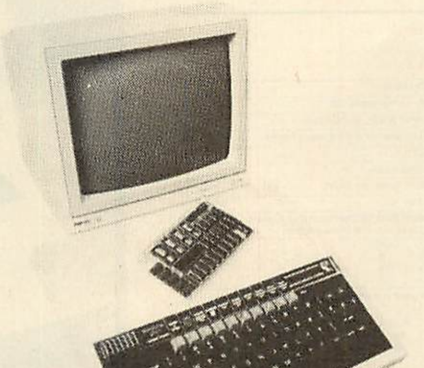
The Fourmeg 32 is a ROM expansion board on its own with up to 224K of installable firmware. It also is the FASTEST shadow RAM board around (it runs at 4 MHz while others run at 2 MHz, including the MASTER), and the fastest Sideways RAM board. It consumes also less power than any other ROM RAM board through the extensive use of CMOS devices.
The top row of five ROM sockets will take software ROMs, up to 32K each, such as used on the Beeb Plus, the MASTER or the Compact. They are high speed sockets.
The middle row contains 40K of high speed CMOS static RAM chips, acting as a Shadow RAM and a printer buffer or as two banks of Sideways RAM. Write-protection of Sideways RAM is performed by separate Read and Write registers with automatic write-protect when one presses the BREAK key.
The CPU is a 4 MHz, CMOS technology, GTE 65C02, similar to the one on the Turbo board, replacing the existing 6502.
The Fourmeg 32K is also upgradable, once more by the latest CMOS technology: 62256, 32k RAM on a single chip which plugs into one of the high speed ROM sockets.

This board is designed such that one can have everything required on a single, compact and easy to install unit. All the necessary software is in a MANAGER ROM (supplied). Star commands include: Shadow, Ramdisk, Ramoff, Ramdfs, Ramadfs, Ramdrive, Testram, Plus. A complete toolkit to assist programming in Basic is also included: Hardbreak, Join, Keyload, Keysave, Kill, Lvar, Menu, Msearch, Mzap, Page, Printer, Rcat, Number, Report, Rload, Rwipe, Salvage, Status, Sound. One year guarantee.

Order as FOURMEG 32 .... £70.00
Additional 32K chip (optional) £15.00
Software packs 1 to 3 (optional), each of five disc £10.00

The Fourmeg 256K board:

The Solidisk Fourmeg 256 board combines high CPU speed (4MHz GTE 65C02) with large memor size (256K Dynamic RAM, 8K static RAM) and powerful supporting software (32K MANAGER ROM). It offers four ROM sockets featuring high speed and high capacity (up to 64K ROM per socket), 8 shadow RAM banks, 8 Sideways RAM banks or even both.
Order as Fourmeg 256K £135.00
NOTE: NO MORE ROM BOARD TRADE-IN IS ALLOWED AFTER 1ST MAY 87.



Wordwise Plus or Interword Special Deal:

If you buy Wordwise Plus or Interword together with a Twomeg or a Fourmeg board, you get extra special discount!
Wordwise Plus (bundle only) £30.00
Interword (bundle only) £50.00

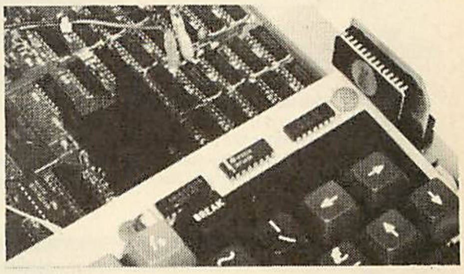
Special Offers on Sideways RAM boards:

These exceedingly popular systems (40,000 plus units sold) enables the Beeb users to load ROM images into the Beeb, make a 16K printer buffer, use DFS with PAGE at &E00, play Solidisk Megagames, bigger Basic (Vstore), store music and inumerable other uses as supported by a library of 15 software diskettes.
They consist of a base unit plugging into the rightmost ROM socket on the Beeb and an exchangeable RAM card with capacity ranging from 32K (two Sideways RAM banks) to 128K (8 Sideways RAM banks). They are now made available to you at less than half their normal price, all offering extremely good value. One year guarantee, supplied with User Manual and one software disc.

SWR32, 32K RAM, disc No 1 .... £20.00
SWR64, 64K ROM and two 16/32K ROM sockets, Disc NoI £30.00
96K Extension for SWR 32 .... £25.00
SWR128 (new style), 128K RAM, two 16/32 ROM sockets £45.00
Software Packs 1 to 3, each of five discs, any pack £10.00
Any disc volume 1 to 15 each £2.00

PLEASE SPECIFY /40 TRACK OR /80 TRACK as applicable.

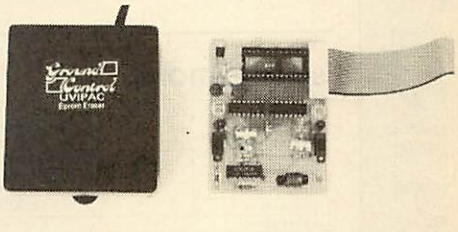
Electron Disc Interface: £50.00
BABT approved Modem plus Linemaster ROM £30.00



EPROM Programmer:

The UVIPROM is the cheapest Eprom programmer on the market yet the easiest to use, will program 2764 EPROMS in one minute and 27128 in two minutes.
A different version called the UVIPROM32 will program 27256 EPROMS in 4 minutes.
The MULTIPROM is the Deluxe version, combining the capacity of the UVIPROM and the UVIPROM32 and some other features. Use it to program 2764, 27128 (normal and A type), 27256 (12.5V and 21V), 27512, 27513 etc. Textool 28 pin ZIP socket fitted as standard.

UVIPROM plus disc No 10 .... £20.00
UVIPROM32 plus disc No 10 .... £20.00
MULTIPROM plus disc No 10 .... £44.50
UVIPAC Eprom Eraser £20.00
2764 EPROM each £2.00, ten for £16.00
27128 EPROM each £4.00, ten for £34.00
27256 EPROM each £7.00, ten for £63.00
Panasonic KX-P1081 Special Offer: .... £149.00 + VAT



IMPORTANT NOTICE: TRADE-UP

Solidisk will accept return of memory boards up to ONE YEAR old for TRADING-UP. The selling price (below) is the price we sell the same goods at the time of the trade-up transaction.

Age	Trade-up allowance
Up to 3 months	90% of selling price
Up to 6 months	85% of selling price
Up to 9 months	80% of selling price
Up to 12 months	75% of selling price

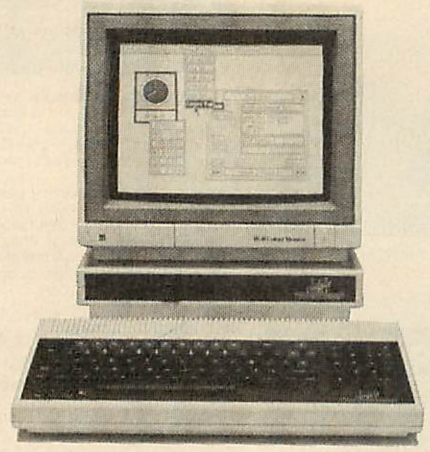
If the balance of the upgrade is less than £15, a minimum charge of 15 is made.

****
As a result of our MASTERPLAN, we have a number of BBC Model B's for sale every day. All are fully inspected, reconditioned if necessary, and guaranteed. All have a new DDFS fitted as standard. We also buy second-hand Beeb for cash. See our price list for details.
****

SOLIDISK TECHNOLOGY LIMITED, 17 SWEYNE AVE, SOUTHEND-ON-SEA, ESSEX SS2 6JQ. TEL. SOUTHEND (0702) 354674 (16 lines).

NEW BRANCH IN BRISTOL OFFICIAL DEALER IN AVON

System One



System One: COMPACT now with 5.25" drives:

The System One consists of a Master Compact 128K, twin disc drives, optional monochrome or colour monitor, optional printer. Solidisk will give you free our own CDFS 2.1 ROM, a Dual Density Beeb Disc Filing System featuring disc sector editor (for both DFS and ADFS discs), MVDFS and MVADFS for cross format file transfer, disc formatter and verifier etc. Some of the options include 5.25" drive(s) which we believe is a better choice than the 3.5" format. The 5.25" format is still preferred for the Master 128 (even now, with 80186 board) and on the Beeb. Cheap discs, better reliability, better software availability are some of the key advantages. Don't buy single drive systems because you can't make copy ADFS discs with a single drive.

Available options (all prices include VAT):

A — Compact 128K with Acorn 14" Colour monitor, CDFS, twin 3.5" drive, one demo disc containing Solidisk Database, Spelling Checker and Megagames (as illustrated): *£749.00*

B — as above but with one 3.5" drive and one 3.5" drive and one 5.25" drive: *£748.00*

C — as above but with twin 5.25" drives in a bridge unit: *£759.00*

Monochrome Option:

All systems above (A, B or C) can be supplied with Acorn 12" monochrome monitor in place of the Colour monitor:-

A *£598.00*

B *£597.00*

C *£608.00*

P-1081 Printer option: £171.45

Buy the Panasonic KX.P1081 NLQ/Super NLQ printer with a System One. At £171.45, you just can't afford to let this latest Japanese printer go. Special reduced price at only .... *£149.00 + VAT.*

SPECIFICATIONS

Print Method	Impact Dot Matrix
Print Speed (cps)	Draft 120 NLQ 24 Compressed 102
Print Mode Selector	Standard/Program, Near-letter quality, Compressed
Print Direction	Bi-directional with logic seeking (Uni-directional in bit image mode)
Print Head	9 pin
Print Head Life	100 million characters
Line Spacing	1/6", 1/8", 7/72", n/72", n/216" (programmable)
Line Feed Speed	100 ms (per 1/6")
Character Set	Full 96 ASCII characters with descenders, Italic, 32 International characters (11 Countries), IBM* special characters, IBM block graphics
Character Structure Draft NLQ Block graphics	HOR × VERT 9 × 9 18 × 18 6 × 12
Bit Images (Dots/inch)	60, 72, 80, 90, 120, 240 (120 can be used in standard or double speed)
Printing Sizes Draft/NLQ Double width Proportional Spacing	Characters per inch: Pica / Elite / Semi-Comp / Comp 10 / 12 / 15 / 17.1 5 / 6 / 7.5 / 8.5 Variable Characters per line: Pica / Elite / Semi-Comp / Comp 80 / 96 / 120 / 137 40 / 48 / 60 / 68 Variable
Paper Feed	Adjustable rear tractor feed and friction feed
Paper Width	Fanfold paper 3" to 10" Single sheet: 4" to 9"
Number of Copies	3 (Original plus 2 non-carbon copies)
Interfaces Standard Optional	8 bit parallel RS-232C (DTR, X-ON/X-OFF or ETX/ACK···KX-P11D, DTR, X-ON/X-OFF···KX-P17)
Buffer Standard Optional	1 K text buffer 4 K text buffer (KX-P12)
Compatibility	RX-80™, IBM Matrix and Graphics Printers (Elite Pitch command of the Proprinter is also available.)
Noise Level	60 dbA
Reliability	MTBF 4000 hours at 25% duty (not including head life)
Environmental Conditions (Controlled)	Operating 41°F to 104°F (5°C to 40°C)/20 to 80% humidity Storage −4°F to 140°F (−20°C to 60°C)/10 to 90% humidity
Power Requirement	240 V AC ±10% 50 Hz 0.6 AMP
Dimensions (W×D×H)	15.9" (403 mm) × 11.3" (286 mm) × 4.5" (115 mm)
Weight	13.4 lbs. (6.1 kg)
Other Options	Color ribbons: Brown (KX-P111), Blue (KX-P112), Red (KX-P113)

*RX-80 is a trademark of Epson America, Inc.
*IBM is a registered trademark of International Business Machines Corp

System Two



System Two: MASTER 12K with Twin 5.25" Drives in a Bridge Unit:

This system is our most popular, consisting of a fully blown MASTER 128K, twin 80 track, double sided 1.3 Megabyte Disc Drives in a bridge unit doubling as a monitor stand, free demo disc containing Solidisk Database, Spelling Checker and Megagames.

Available options (all prices include VAT):

A — As illustrated (without monitor) *£670.00*

B — with Philips 14" CM 8533 colour monitor (same construction as Acorn colour monitor) *£865.00*

C — with Mitsubishi 14" XC 1404 colour monitor *£830.00*

Special offers (if bought together with a System Two):

MP-165 .... *£220.00*

P-1081 .... *£171.45*

Master 80186, 512K Co-processor *£223.00*

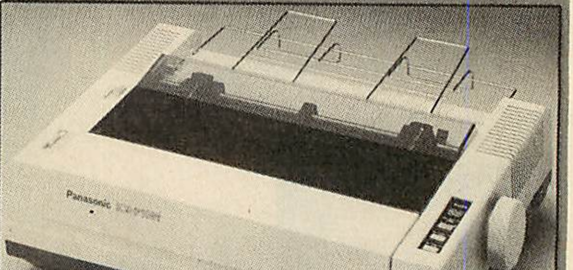
Acorn 20 MB Winchester .... *POA*

Solidisk 20 MB Winchester (special issue, only with 80186 option) *£500.00*

MP-165 Printer option: £220.00

The MP 165 is one of our best selling printers, featuring 165 cps in draft mode, 40-50 cps in NLQ, Epson FX compatibility, friction and tractor feed etc. Normal price is extremely attractive at £260.00 when you consider that the MP 165 is a lot faster than its rivals such as the Star NL-10, the Kaga KP-810, the EPSON LX86 or FX85 etc. We will cut £40 off the normal price and give you a free printer lead if you buy the MP-165 together with a System.

Special Offer £179.99



FREE 2M LEAD! ONLY FROM SOLIDISK

SOLIDISK TECHNOLOGY LIMITED, 17 SWEYNE AVE, SOUTHEND-ON-SEA, ESSEX SS2 6JQ. TEL. SOUTHEND (0702) 354674 (16 lines).

MASTER SERIES:

AMB15	Master 128	499.00
ABD12	Master ET	399.00
ADC06	Turbo Upgrade	125
ADC08	80126/512K	228.00
ADF13	Eprom cartridge	14.95

MANUALS AND DOCUMENTATION:

ADJ22	Ref manual Pt 1	14.95
ADJ23	Ref manual Pt 2	14.95

MASTER COMPACT SERIES:

ADB20	Master Compact Single drive	441.25
ADB20+ADF30	Master Compact S/D with TV mod.	457.35
ADB20+ADF31	Master Compact S/D with Mono monitor	537.85
ADB20+ADF32	Master Compact S/D with Colour monitor	687.35
ADF15	RS232 kit	29.90
ADF16	Second 3.5" floppy drive	113.85
ADF17	PAL TV Adaptor	29.90

ACORN SOFTWARE:

SUB27	Viewstore database ROM	59.80
SUB18	Pascal	69.00
	FORTH	19.90
	LISP	19.90
	MICRO-PROLOG	79.95

SOLIDISK SOFTWARE ROMS:

PCFS	Compatible with PC and MS DOS discs	15.00
PCMAN	MANUAL FOR PCFS	5.00
CDFS	single and double density DFS ROM for the COMPACT	10.00
MADFS	DFS and ADFS ROM (32k) for the Master	20.00
LMS	communication ROM for the Master	10.00
SOLIMON	Machine code monitor for Master/Compact	10.00
INSIGHT	Intelligent disassembler, XREF	20.00
UVP	Eprom programmer software (8k)	5.00

ECONET PRODUCTS:

ADF10	Econet plug-in	49.99
AEH17	100m Cable	99.00
AEH18	10station lead set	29.00
AEH19	Econet starter kit	99.00
AEH20	Econet bridge	199.00
AEH21	Econet socket kit	29.95
AES21	Level 2 Fileserver	249.00
AES22	Printer server ROM	49.00

DISC DRIVES:

FD35	3.5" 80-track double-sided single drive	£100.00
TWIN35	Twin DF35	£200.00
FD525	5.25" 80-track double-sided single drive	£115.00
TWIN525	Twin FD525	£230.00
20MB	Winchester new model, low cost SEAGATE	£700.00

PRINTERS:

LX86	EPSON LX86 + 2M printer lead	249.00
LXTF	LX80 Tractor Feed	31.30
LXCSF	LX80 Cut Sheet Feeder	53.53
FX85	EPSON FX85 NLQ + 2M printer lead	350.00
FXTF	FX85 Tractor Feed	30.59
FXCSF	FX85 Cut Sheet Feeder	123.50
NL10	STAR 80 col-120 cps par. 2M lead	289.00
NLCSF	Cut Sheet Feeder for NL-10	59.99
NLRIB	Black Ribbon for NL 10	5.64
MP165	Tractor and pich feed, 165 cps, NLQ, 2M printer lead, exceptional value	260.00
EPSRIB	Black ribbon for Epson and MP165	4.00
J6100	JUKI 6100 Daisy Wheel + 2M printer lead	340.00
JURIB	JUKI 6100 black vinyl printer ribbon	2.00
PAPER	2000 sheets cont. paper, A4 size 11" x 9.5"	14.00

MONITORS:

BM7502	12" Philips hi-res green screen, lead	85.00
BM7522	12" Philips hi-res amber screen, lead	86.00
CM8533	14" hi-res Colour Monitor, lead	299.00
TAXAN3	12" TAXAN Supervision 3, hi-res RGB Colour, lead	375.00
TAXAN2	12" TAXAN Supervision 2, Merdium-res RGB Colour monitor, lead	315.00
XC1404	14" Mitsubishi RGB colour monitor, lead	260.00

SOFTWARE PACKS:

SWPK1	5 software discs, 80 track. Database, spelling checker, machine code monitor, Macro Basic etc. 5.25" format	£10.00
	3.5" format	£15.00
SWPK2	5 software discs, 80 track. Games. 5.25" format	£10.00
	3.5" format	£15.00

DISKETTES:

MD525	5¼" low cost VEREX for all drives	.12.00
MD557	5¼" hi-rel MD557, Verbatim DSDD 96tpi	25.00
C102	3.5" low cost Verbatim for all drives	20.00
C103	3.5" hi-rel 90097M Vertbatim DSDD 135 tpi	28.00
C104	3" CF2/MSOFT for all Amstrad drives	39.00

CARTRIDGES:

ADF13	Acorn Eprom cartridge for two 27128	14.95
EPR32	Solidisk Eprom cartridge for one 27256	8.00
RAM32	Solidisk 32K RAM cartridge with battery backup and write protect switch	25.00
MEGA256	Solidisk 256K Mega-RAM card with RAM disc and printer buffer in ROM	100.00
MEGA256	Solidisk 1 Megabyte Mega-RAM card with RAM disc and printer buffer in ROM	POA
	Expected price in April/May	225.00

EXTRA DISCOUNT

If you buy a disc drive or a printer or a monitor at the same time you buy a Master or a Compact, you are qualified for SYSTEM DISCOUNT and a free Software Pack 1 (worth £10.00 or more).

Normal Package Price	System Discount	Reduction
£600-£699	3%	£18-£21
£700-£799	4%	£28-£32
£800-£899	5%	£40-£45
£900-£999	6%	£54-£60
£1000 and above	7%	£70-£££

Example of system		normal price	Discount	Net price
1	Compact Mono + MP165 printer	797.85	31.95	765.94
2	Compact Colour + Juki 6100	1027.35	71.89	955.11
3	Master 128 + twin F/Drives	729.00	29.16	699.84
4	Master 128, twin F/Drives, CM8533 Colour monitor	1028.00	71.96	956.04
5	example 4 + MP165 printer	1288.00	90.15	1197-84
6	Master 512 + twin F/Drives	957.00	57.42	899.58
7	Master 512 + twin F/Drives, plus 20 MB Winchester	1657.00	115.99	1541.01

SECONDHAND BEEB AND UPGRADE TO MASTER:

We buy and sell good condition second hand Beebs, even by post. Proof of original purchase is required if you are only selling your computer. Reduced commission is available if you are UPGRADING your BBC to a Master, ask for a MASTERPLAN quotation.

BBC Model	we buy at	we sell at
B-issue 2	131	175
B-issue 3	191	225
B-issue 4	187	250
B-issue 7	225	300

The prices above are given as average for very clean and good condition machines. Please ring for stock allocation before you call.

ORDERING BY POST:

All items can be ordered by post, sending the coupon below and enclosing cheques, POs, drafts or credit card numbers or by phone. P and P is charged as follows:
Less than 1 KG (eg software, cartridges and books): **£2.00**
Up to 3 KGs (eg single disc drives): **£3.00**
Up to 10 KGs (eg computer, monitors, printers, twin disc drives): you can specify either parcel post £6.00 or courrier/Datapost: **£12.00.**
Above 10KGs (eg complete system), please either allow generously or give us a ring for quotation.

ORDER FORM

Please fill and send to:
Solidisk Technology Ltd
17 Sweyne Avenue
Southend-on-Sea, Essex SS2 6JQ

Name: ....

Address: ....

....

....

Items: ....

Price: .... P & P: £2/£3/£6/£12

Total: ....

Access/Barclay:

Solidisk Technology Limited, 17 Sweyne Ave, Southend-on-Sea, Essex SS2 6JQ. Tel: Southend (0702) 354674 (16 lines).

OFFICIAL DEALERS IN ESSEX

SOLIDISK TECHNOLOGY LIMITED, 17 SWEYNE AVE, SOUTHEND-ON-SEA, ESSEX SS2 6JQ. TEL. SOUTHEND (0702) 354674 (16 lines).

USER GROUPS

LONDON

London. Association of London Computer Clubs: Robin Bradbeer, Polytechnic Of North London, Holloway, London N7 8DB.
London. Association of Computer Clubs: Rupert Steele, 12 Philbeach Gardens, London SW5 9DY
London. Radio Amateur Micro User Group: contact by bulletin board No 86300198
East London. SOBAT Computer Club: Mr T A Kayani, 12 Calderon Road, London E11 4EU
Tel: 01-556 5423
North London. BBC Micro Users Group: Mr Ric Keyworth, 'The Penthouse', 4b Kilburn High Road, London NW6 5UL
Tel: 01-734 9235
North London. North London BBC Micro User Group: 82 Hornsey Lane, London N6 5LU
Tel: 01-263 6760 (eves)
Wandsworth. Wandsworth Computer Club: C Kendrick, Earlsfield Library, Magdalen Road, London SW16
West London. Personal Computer Club: Chris, Tel: 01-743 1579; Steve, Tel: 01-540 6271; Blue, Tel: 01-579 5415

SOUTH-EAST

Aylesbury. BBC Micro User Group: Aston Clinton County Combined School, Twitchell Lane, Aston Clinton, Aylesbury, Bucks HP22 5JJ
Tel: (0296) 630276
Bognor Regis. Bognor Computer Group: E R Piper, 2 Ely Gardens, Aldwick Park, Bognor Regis, Sussex PO21 3RY
Bracknell. Bracknell Primary Schools Computer Users Group: D Donaldson, Wildridings County Junior School, Netherton, Bracknell, Berks RG12 4DX
Brighton, Hove & District. Brighton, Hove & District Computer Club: J Smith, 30 Leicester Villas, Hove, E. Sussex BN3 5SQ
Brighton. Brighton Area Micro Enthusiasts: c/o 41 Westdene Drive, Brighton. Prestel mailbox 919995582. Contact Mr Edwards
Bucks. South Bucks Acorn Computer Club: David Park, 160 White Hill, Chesham, Bucks HP5 1AZ
Tel: Chesham 783097
Camberley. Camberley Computer Users Club: David Crosby-Clarke
Tel: Crowthorne 771590
Prestel mailbox 344771590
Carshalton. Acorn Atom User Club: Kevin Roll, 66 Shaldon Drive, Morden, Surrey
Tel: 01-540 5282
Caterham. Computer Club: Caterham Leisure Centre, Godstone Road, Caterham, Surrey CR3 6RE
Dartford. CP/M User Group: Diana Fordred, 72 Mill Road, Hawley, Dartford, Kent
Tel: (0322) 22669
Guildford. West Surrey Computer Club: Jan Spencer, 52 Lindfield Gardens, Guildford, Surrey GU1 1TS
Tel: (0483) 63512
Harpenden. Harpenden Microcomputer Group: P Cowley, 36 Southdown Road, Harpenden, Herts AL5 1PG
Harrow. Harrow Computer Group: Bazyle Butcher, 16 St Peter's Close, Bushey Heath, Watford WD2 3LG
Tel: 01-950 7068
Ilford. ILBUG: Peter Jones, 1 De Vere Gardens, Cranbrook, Ilford, Essex IG1 3EB
Tel: 01-554 9825
Iver. Iver Computer Society: John Haigh, 11 Colliston Walk, Ford's Farm, Calcot, Reading, Berks RG3 5ZJ
Tel: (0734) 417534
North & Mid Essex. User Group (NAMEBUG): Andy Purkiss, 12 Palm Close, Witham, Essex
Tel: (0376) 515609. Prestel: 376515609
Reading. Reading User Group (RUG): Richard Rowlands,
Tel: Reading 596825 (eves)
South East Essex. BBC User Group (SEEBUG): Mr A P Jordan, 97 Oakhurst Drive, Wickford, Essex SS12 0NW
Tel: Rayleigh 771428
Sutton. Sutton Library Computer Club: The Secretary, 21 Village Row, Sutton, Surrey SM2 6JZ
Tel: 01-642 3102
Welling. Computer Users Club: Tony Latham, 69 Hadlow Road, Welling, Kent DA16 1AX

SOUTH & SOUTH-WEST

Alton. Alton Computer & Electronics Society: Kevin Weatherhead, Sheen, Old Odiham Road, Alton, Hants GU34 4BW
Tel: Alton 87478
Bristol. Format 40/80 Club: BBC Disc User Group, Peter Hughes, 5 Marsh Street, Bristol BS1 4AA
Tel: (0272) 799979
Fareham. Porchester & Fareham Computer Club: Simon Ward, 9a East Cams Close, Downend, Fareham, Hants PO16 8RP
Gosport. Borough of Gosport BBC Users Group (BOGBUG): Graham Dubber, 128 Wych Lane, Gosport, Hants PO13 0TE
Tel: (0329) 282221 (evenings)
Radio. AMRAC (Amateur Radio and Computers): Mr T Triggel, Gleness, East Boldre, Brockenhurst, Hants SO42 7WD
Tel: (0590) 612130

MIDLANDS & ANGLIA

Boston. Boston Acorn Computer Users Club: J C Goodwin, 245 Church Green Road, Fishloft, Boston, Lincs PE21 0RP
Burton-on-Trent. Beeb Users' Group (Bug Club): Mrs Linda Yeomans, 13 Regent Street, Church Gresley, Burton-on-Trent, Staffs DE11 9PL
Tel: (0283) 216445 (eves)
Cambridge. Bottisham Acorn User Group: Peter Rank,
Tel: Cambridge 812080, or Gerald Wilcockson, 19 Gallows Hill, Saffron Walden, Essex CB11 4DA
Tel: Saffron Walden 23793
Derby. The Derby Microcomputer Society: F Taylor, Secretary, c/o 5 Park View Close, Allestree, Derby DE3 2GH
Tel: Derby 559334
Dudley. Kingswinford BBC Micro Club: Kingswinford Community Centre, High Street, Kingswinford, Dudley, West Midlands
Tel: Dudley 212538
Glossop. Glossop Computer Club (Derbyshire): T S Fox, 4 Park Lane, Little Hayfield, Stockport, Cheshire SK12 5NW
Tel: (0663) 44260
Huntingdon. RAF Personal Computer Association: Sqn Ldr J A Upham, Man S (ADP), HQ RAFSC, RAF Brampton, Huntingdon PE18 8QL
Norwich. Amateur Computer Club: Andy Leeder, Church Farm, Stratton St Michael, Norwich NR15 2QB
Norwich. Norwich & District BBC Microcomputer User Group: Roy Street, Church Farmhouse, Themelthorpe, Dareham, Norfolk NR20 5PS
Tel: Foulsham 579
Nottingham. Micro Club: John Day, 8 Warkton Close, Chilwell, Notts NG9 5FR
Tel: (0602) 225660. Prestel: 602225660
Redditch. Redditch Computer Club: Anthony Green, 14 Radway Close, Redditch, Worcs B98 8RZ
Tel: (0527) 61434
Stoke. POTBUG BBC User Group: J Forest, 50 Cliff Street, Smallthorne, Stoke-on-Trent, Staffs
Tel: 818430
Stratford. Stratford Computer Club: Chris Parry, 15 Kipling Road, Stratford-on-Avon
Tel: (0789) 68080
Suffolk. West Suffolk BBC Micro Users' Club: Antony Hurden, 14 Plovers Way, Bury St Edmunds, Suffolk IP33 2NJ

NORTH-WEST

Cheshire. Mid-Cheshire Computer Club: Michael Christie, 496 The High Street, Winsford, Cheshire
Cumbria. West Cumbria User Group: P Majid, Tel: (0946) 62732 or K Purkiss, Tel: (0946) 66586
Liverpool. Mersey BBC User Group: Nik Kelly, 56 Queen's Drive, Liverpool L4 6SH
Rochdale. Rochdale BBC Micro User Group: c/o 6 Dunbar Grove, Darnhill Estate, Heywood, Lancs OL10 3QJ
Wirral. Wirral Micro Users Club: David Walsh, 23 The Pines, Bebington, Wirral, Merseyside L63 9PH

NORTH-EAST

Bridlington. Solinet: Kenneth Hardacre, 13 St John Street, Bridlington, East Yorkshire YO16 5NL
Huddersfield. Huddersfield BBC Micro User Group: S Gill, 21 Mayfair Avenue, Sowood, Halifax, W. Yorks
Tel: (0422) 73058
Hull. Forum 80: 421 Endike Lane, Hull HU6 8AG
Hull. MUSE (for teachers): PO Box 43, 231/2 Friary Chambers, Whitefrairgate, Hull HU1 2HD
Tel: (0482) 20268
Keighly. Keighly Computer Club: Colin Price, 'Apple Garth', The Hob Hill, Steeton, Keighly, W. Yorks
Tel: (0535) 54738
Leeds. Garforth BBC User Group: D G Pell, 84 Park Lane, Rothwell, Leeds LS26 0EY
Newcastle. Newcastle & Washington BBC User Group (NEWBUG): Multi-purpose centre, Oxclose Village, Washington, Tyne & Wear
Tel: (0783) 813175 (eves)
Northumberland. NEBUG: Ian Douglas Chapman, 13 Pont St, Ashington, Northumberland
Tel: 0670 856273
Sheffield. Parsons Cross BBC User Group: Andrew Grant, 28 Rokeby Road, Sheffield S5 9FU
Tel: (0742) 461203
S Yorks. South Yorks Personal Computer Group: Bob Hindle, 139 Penrhyn Road, Sheffield S11 8UP
Wakefield. Wakefield BBC Micro User Group: PO Box 65, Wakefield, West Yorkshire WF2 6YZ

SCOTLAND

Econet. User Group (Scotland): c/o Michael Ryan, Balkeerie Cottage, Eassie, by Forfar, Angus
Central Scotland. BBC User Group: D Davidson, 1 Roxburgh Place, Larbett, Stirlingshire FK5 4UE
Tel: (0324) 558692
Inverclyde: Inverclyde BBC Micro Users Club: Robert Watt, 38 Wellyard Way, Greenock, Renfrewshire PA16 0XG
Tel: Gourock 39967

WALES

Cardiff. Cardiff BBC Computer Club: Geoffrey Barker, 2 Whitcliffe Drive, Penarth CF6 2RY
Tel: (0222) 701023

N. IRELAND

Belfast. Belfast Computer Club: Andrew White, 19 Greenpark Drive, Markethill, Co Armagh BT60 1PX

OVERSEAS

Australia: BBC Users Group of Canberra: PO Box E58, Queen Victoria Terrace, ACT 2600
Australia. Beebnet: M A Cowley, PO Box 262, Kingswood, South Australia 5062
Australia. Ozbeeb Sydney, meetings North Ryde, PO Box 1030, Parramatta 2150
Tel: day 635 4868, eve 868 4455
Australia. Dapto BBC User Group: PO Box 447, Dapto, NSW 2530
Canada. Atom Users Group of Canada: John Wood, 812 Cabot Trail, Milton, Ontario L9T 3M8
Canary Islands (Spain). BBC Micro Club Tenerife: PO Box 560, 3800 Santa Cruz de Tenerife
Eire. Irish Amateur Computer Club: Austin Vaughan, 35 Monastery Drive, Clondalkin, Dublin 22. Tel: 01-593112 (eves)
Eire. OIFIG (Official Irish Forth Interest Group): c/o Hugh Dobbs, Newton School, Waterford
Finland. Arien Raateland, Hopeatie 10A21, 00440 Helsinki 44
France. Club Informatique Assevent: Claude Laurent, 1 rue du Marechal Leclerc, Assevent 59600. Tel: (27) 652294
Greece. Microclub: C Mantazavinatos, 17 Stournara Str. 106 82 Athens
Hong Kong. Acorn Computer Users Society of Hong Kong: PO Box 13330, Central PO, HK
Malaysia. Sabah Computer User Group: c/o Albert Vun, PO Box 69, Kota Vun, Sabah, Malaysia
Malta. BBC Micro Users Club (Malbeeb): Ray C Zammit, 20 Oleander Avenue, Santa Lucia
Netherlands. Big Ben Club: J W Vuurpijl, Hein Baderstraat 36, 2171 XP Sassenheim
New Zealand. BBC/Acorn Computer User Group of NZ: PO Box 9592, Wellington
New Zealand. Christchurch BBC & Electron Users Group: Mrs Rebe Nolan, 87 Palmers Road, Christchurch 9
Norway. BBC INFO: Horten Ingenlorhogskole, Skippergt. 6, 3190 Horten
Norway. Skandinavian BBC User Group: Frans-Otto Hendriks, Ludvig Karstensvei 14, 1064 Oslo 10
Pakistan. BBC Users Group: Capt. Z A Kidvai. Tel: Karachi 540986
South Africa. Acorn Atom Users Group: J G Dowling, 27 Oribi Avenue, Van Riebeeck Park, Kempton Park 1620
South Africa. Pretoria BBC Users Group: Stan Miller, PO Box 117, Montana 0151
South Africa. Tygerberg BBC User Group (Tygerbug): R P Donavan, 16 Bakker Street, Welgemoed, Bellville 7530
Sweden. BBC User Group: Anders Wichman, Folkungagatan 58, 11622 Stockholm
Sweden. Acorn User Society of Sweden: Tord Israelson, Tuppa Klaras Vag 12, S-702 29, Orebro, Sweden
Tasmania. BBC Users Group (Tasbeeb): Box 25 PO, North Hobart 7002

SPECIAL INTEREST

Accounts. BEEBACC: Brian Pain, 40a High Street, Stony Stratford, Milton Keynes
Tel: (0908) 564271
Adventure. International Adventure Club: Simon Martin Clarke, 10 Ennis Close, Harpenden, Herts AL5 1SS
Bulletin Boards. Forum 80: 421 Endike Lane, Hull HU6 8AG
CP/M. CP/M User Group: Diana Fordred, 72 Mill Road, Hawley, Dartford, Kent
Tel: (0322) 22669
Disc Users. Format 40/80 Club (BBC Disc User Group): Peter Hughes, 5 Marsh Street, Bristol BS1 4AA
Education. Micros and Primary Education (MAPE): c/o Mrs G Jones, 76 Sudbrooke Holme Drive, Sudbrooke, Lincs LN2 2SF
Electronics. Alton Computer & Electronics Society: Kevin Weatherhead, Sheen, Old Odiham Road, Alton, Hants GU34 4BW
Tel: Alton 87478
Heraldry Society. Colin Forrester, 5 Hook Road, Epsom, Surrey KT19 8TH
Logo. British Logo Users Group (BLUG): Richard Olney, c/o London Technology Network, 86-100 St Pancras Way, London WC1
MUSE. PO Box 43, Houghton on the Hill, Leicester LE7 9GX. Tel: (0533) 433839

ACORN USER ADVERTISEMENT PAGES – JUNE 1987

FREE ADS

BBC penpal wanted to exchange information. All letters will be answered Write to: Theresa Giacoumatou, 18, Gravias Str, Argiroupolis 16451, Greece.
Penpal wanted to swap hints tips and ideas. Write to: Rickie Sharrman, 95 Urney Road, Strabane, County Tyrone, Northen Ireland, BT82 9RT.
Penfriends with BBC B wanted. Write to: Martin van den Berg, Zandvoorlweg 37, 3741 *BB Baarn, Holland.*
Electron owner is looking for penpals anywhere. To swap programs and ideas. Write to: Darren Condon, 59 Castle Close, Clondalkin, Dublin 22, Ireland.
Torch ZEP100 + software £125; Z80 BBC Basic, Microsoft Basic, TLO programe generator, Turbo Pascal, £50 each or £250 the lot. Tel: 031-667 4180, evenings.
Electron with Plus One and Plus Three all boxed, manuals and software £220. Tel: (0388) 720442.
BBC B OS 1.2 Acorn DFS, Viglen 40/80 double sided drive, 16k sideways RAM, Quickshot II joystick, software including over 45 ROMs, £495. Tel: 01-390 4310
Solidisk Twomeg 256k with manager ROM and manual, two months old, £75. Tel: (0366) 501001.
Electron, Plus Three, Plus One, Joysticks, T2P3, books, magazines, data recorder and original software, £230. Tel: (0279) 59211, after 6pm.
Lightpen with software £19.95 on tape or disc. Send to: 68 Salisbury Road, Totton, Southampton, Hants, SO4 3JB.
Torch Z80/BBC system, Acorn DFS, Pace dual 40/80 drives, monitor, NLQ printer, software. £775 ono (will split). Tel: Wolverhampton (0902) 332929.
Viglen disc drive, single sided 40/80 track + PSU, £80 or ono. Tel: 01-555 3808, after 4pm.
Canon PW-1080A dot-matrix printer, 160cps, Epson-compatible, NLQ, £180 ono. Tel: 035-478 310.
BBC B OS 1.2, Acorn 0.90 DFS, Akhter disc drive, software, £400 ono. Everything in excellent condition. Contact 57 Chestnut Crescent, March, Cambs.
Wanted information about receiving radio teletype on BBC micro. Contact: N Jowsey 9 Ribstone Grove, Appletree Village, Burnholme, York YO3 0NX with details.
Torch Z80 second processor, boxed with perfect suite and a great deal of professional software, £175. Tel: Formby 72687.
BBC Master 512, still under guarantee, plus all manuals and ROM cartridges, £475. Tel: Leeds (0532) 586983, evenings and weekends.
Electron Plus Three wanted. Tel: (026 782) 212. Good price paid.
BBC B with data recorder in perfect condition, hardly used. Tel: (0533) 766439, £250.
Robo Bitstik 2 A3/A4 plotter, complete system drawing package for BBC B+. Mint condition, unused. £370. Tel: Nigel (0203) 503042.
Monitor for sale, Microvitec 1441 hi-res colour monitor with BBC lead. Cost £500, sell for only £350 ono. Tel: 01-866 1248, evenings.
BBC B OS 1.2 including Watford 12 ROM Board. Pace 40/80 switchable disc drive. *View,* AMX Mouse, and *Superart* ROM plus software. Replay ROM, LBO ROM, and more, £750. Tel: (0252) 515896, evenings.
Metal detector, trowel, books for sale or swap for teletext adaptor. Rickie, 95, Urney Road, Strabane, County Tyrone, NI, BT82 9RT.
Slogger Master RAM board kit (unused) £40. *Starstore II* ROM, £20. Both for Electron. Tel: (078571) 3855, after 6pm.
BBC B Torch Z80 drives OS 1.2, Acorn DFS, Userdump Perfect calc, writer, filer, datacorder software, green monitor, manuals, £750 ono. Tel: (0823) 76003, evenings after 6pm.
Wanted AMX Mouse or similar plus copy of circuit diagram for Centronics GLP 3101 printer (Brother MI109). Tel: 091-284 4343, after 6pm and weekends.
Acorn Z80 second processor with all software and manuals, almost new best offer around £180. Tel: Folkestone (0303) 56469.
Silver Reed EX43 typewriter/printer plus interface. Connect to Beeb/Master for perfect print. Worth £340, sell £180. Perfect condition. Tel: Doncaster (0302) 342256, after 4.30pm.
BBC B, issue 7, 1770 DFS 40/80 d/s drive, Microvitec 1431 monitor, 32k SWR, speech synth, considerable software, £450. Tel: (06065) 56814.
Solidisk Fourmeg 256k complete *WW+* manager, £100, 1770 DDFS £20, *Scribe* DDFS £20. Tel: Medway (0634) 250272, 8.30am To 4.30pm.
BBC B, no frills. Better than sitting in my cupboard! Only £188. No offers. Please ring Portsmouth (0705) 690882.
VHF-FM microtransmitter kit. Transmits onto domestic radio, range up to one mile, size 1"x3"x0.5" price £11.95. Julian Cox, 11 Cheswick Drive, Gosforth, Newcastle, NE3 5DF.
Cheetah speech synthesis module for BBC A/B, just plugs in, £13. Phone: (025481) 2177.
Master 128 plus Turbo, manuals, software, medium resolution RGB monitor, twin 400k drives inc. PSU, Acorn Z80 processor, £900. Tel: (0604) 413552.
Genlock board for BBC for sale. Call: 010-311858 17664 or write: John Brus, PO Box 5390, 3002 A3, Rotterdam. Netherlands.
Acorn 6502 second processor complete, £75. NEC8023 100cps dot-matrix printer, £75. Phone: 01-868 4586, after 7pm or 01-847 6805, office hours.
BBC B, cassette *ViewSheet,* software joysticks, all little used. New Akhter MD802E twin floppy disc drive, excellent condition, £540. Tel: 01-777 9122.
Z80 second processor, all manuals, and software including wordprocessor, database, spreadsheet, nucleus, Cobol, mint condition, £250. Phone: Ascot (0990) 27951.
Acorn 32106 second processor, full software manuals etc. 512k RAM. House move forces sale. Reasonable offers. Tel: Paul (0440) 62732.
Z80 second processor for sale, £150. Telephone 031-667 5046.
Master 128 with 80186 (512k) coprocessor, twin drives, hi-res Microvitec colour monitor, serious software. All 1987 purchases, £1050. Tel: Cambridge (0223) 324902, evenings.
BBC Master Compact computer, drive, TV modulator. Brand new, boxed, £350. Unwanted prize. Egham near London. Phone: (0784) 31125.
Disc drives, 40 track, single and double, £50 and £65. Phone: (0272) 717553, weekends only.
BBC B 40 track disc drive, ATPL Sidewise, ROMs, 16k RAM, AMX Mouse, carrying case, software, manuals, £375 ono. Consider splitting, Tel: 01-645 0542.
Acorn Z80 second processor for sale. Complete software and documentation, £180 ono. Phone: 01-658 5602.
Electron and data recorder, brand new/unused, complete with manuals, leads and games. All for £65. Tel: (0942) 382886 (evenings and weekends).
And there was a BBC fanzine! Send 50 pence for issue 3 to: ATTW, 5 Loch Lane, Watton, Thetford, Norfolk.
Torch users! mode 4/5 graphics dump 3½ times faster than Zdump. Sae for free listings: G Sargent, 45 Osborne Road, Loughborough LE11 0RY.
6502 Acorn second processor, Hi-Basic ROM, manual, boxed, excellent condition, £90. Tel: Washington 4174168, evenings after 6pm.
Wanted Epson-compatible printer with NLQ eg, Citizen 120 D. Tel: Abergavenny (0873) 3549.
Electron with Plus One, Plus Three. *View, ViewSheet,* some software, manuals, books, magazines, £175. Tel: Grantham (0746) 62789.
Do you want to swap ideas, information? Do you have a disc drive? Write to: N Mahoney, Flat 14, Alloway Place West, Dundee.
BBC B OS 1.2 issue 4 Solidisk 256k 4 meg, DFS, ADFS RTC lightpen £390, ono. Romford, Essex. Tel: (0708) 41680, evenings, weekends.
BBC video digitiser (Watford) as new, boxed with manual and ROM, £55. 3-inch disc drive cased PSU, £30. Tel: (0272) 781178.
Wanted B+, drive(s), monitor, SWR plus extras. Details to: J Warriner, Malet Lambert School, James Reckitt Avenue, Hull, North Humberside.
Replay for Acorn 8271 DFS, £20, boxed as new. Phone: (0572) 55520.
Electron, Plus 1, ROM Box, Plus 3, discs 16k RAM *View, Viewsheet, Starstore, Starwork* DFS. T2P3 all manuals £290 ono, phone after 6pm 02372 76264,
Wanted Watford 32k shadow RAM board, and teletext adaptor. Phone: Derby (03320) 556381.
Wanted Electron Plus One or Slogger equiv. Tel: (0226) 63545.
BBC B Acorn DFS Aries B12 board, *Wordwise,* Toolkit, Acorn ISO Pascal, Acorn disc drive, Seikosha GP 100 printer, £350. Tel: (0395) 273377.
LVL double density disc, interface. Also Graphics Extension ROM by Acornsoft, £25. Tel: (08242) 3466.
Electron with upgraded Plus One ROM Box, AP4, *View, ViewSheet,* T2P4, and ADT, all boxed. Manuals magazines, software. Offers, £240+. Tel: Licoln 730268.
Watford Transferom tape-to-disc utility. Boxed with manual, hardly used, £20. Tel: Ian (0905) 612672, after 6pm.
For Sale over £200 tapes, data recorder, LVL echo keyboard, Quickshot 1 joystick, many magazines and books, £100 the lot. Tel: 061 707 1857, after 6pm.
Microvitec 1451 medium resolution monitor. Excellent condition £175. Tel: 078-571 3855, after 6pm.
BBC B, DFS, disc drive, endless software, ROMs, games cassette recorder, joystick, dust cover. All leads, manuals, £350. Tel: (0908) 677366.
Disc drive, good condition, single 40 track s/s, complete with leads, utility discs and manual, ono. £55. Tel: Codsall (09074) 4832.
BBC model B, last version with Acorn DFS, £250. 100k disc drive, £75. RGB monitor, £150. Adrian Price, Kidderminster (0562) 700916.
BBC B OS 1.2, Acorn DFS, Viglen 40/80 d/s drive 16k sideways RAM joystick, software, including over 45 ROMs, £495. Tel: 01-390 4310.
BBC B OS 1.2, Basic 2 with data recorder plus software bargain at £170. Ring: Shane on 01-672 2706, after 6pm.

FREE PERSONAL AD SERVICE

Fill in the form below to a maximum of 20 words (one in each box) and send it to *Acorn User* Free Ads, 141-143 Drury Lane, London WC2B 5TF. Please use capital letters, write clearly, and remember your name, address and telephone number. Without this full information, supplied on a separate sheet of paper, we regret we cannot carry your Free Ad. We cannot accept entries selling or swapping software. This is a service to readers – no companies please. One entry per form only. Free Ads are carried in the magazine as space permits, and any Free Ads not used within a month of receipt will be disposed of.

ACORN USER'S

DIARY

Gotcha!

Dateline April 1st. Micronit arrange bogus news story concerning 'revolutionary' new disc drive heads. The idea seems to have been that the floppy spins one way and the drive head the other. This, they claimed, increases the amount of data you can get on a disc. Quelle horreur! Many people now strongly deny having phoned for details, among them Tubelink editor Ben Rietti.

Free game 2

Abuser presents the second great single-line game, called, for no good reason, *Lexxias*. The scenario goes something like this: you are the last being between the universe and total oblivion. To save civilisation from the ravages of umm... err... You must catch the mind-bogglingly savage 'things' as they drop from the top of the screen. The quicker you catch them, the more points you get. As you catch one, another appears. When one reaches the bottom, you die. Sounds good, huh?

```
1 MO.6:X=0:Y=0:S=0:REP.P=RND(39):Q=2:REP.V.279;0;0;0;0;31,P,Q-1,32,8,10,36:F.I=1TO7:V.31,X,Y,85,8:X=X-(INKEY-67A.X<39)+(INKEY-98A.X>1):Y=Y-(INKEY-105A.Y<21)+(INKEY-73A.Y>1):V.32:N.:Q=Q+1:U.Q=22OR(X=P A.Y=Q):V.8,11,32,30:S=S+22-Q:P.S:U.Q=22
```

Type in the program. Now program the function key:

*key 0 MRUN M

The top score so far is 82.

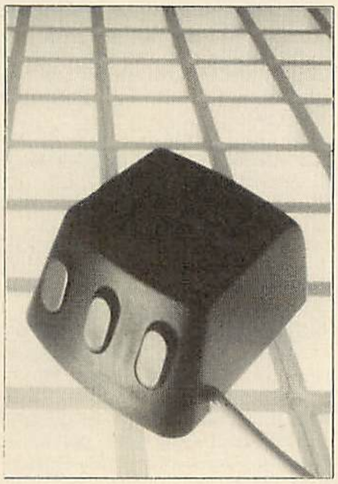
We are now working hard on an enhanced Master version, to include over 0.5k of extra graphics and music stored to the sideways RAM.

Mouse in the house

It was a heart-stopping moment in the *Acorn User* offices when a reader rang in and, through the hisses and crackles of a deteriorating phone line, complained of a mouse playing havoc with his new pacemaker.

Visions swam before us of some poor blue-faced blighter struggling desperately with a terrified pet trapped in his mobile life-support system.

There was little we could do over the phone. And then the victim started to mutter something about AMX and desktop publishing. He must be a journalist, we decided. Even as he struggled in the grip of a potentially fatal rodent he was concerned about getting his copy out. What a pro! Finally his voice came through clearly. 'For the last time, do I need the mouse ROM to run AMX *Pacemaker*?' Well, it was the kind of mistake anyone could make. Or is it true when AMS says it has your best interest at heart?



If you go down to the woods

Woodlands, home of BBC Enterprises, is not a place people joke about. The very name inspires fear and loathing, not least among the poor, haggard denizens of the underworld, better known as BBC Soft.

The building – a classic example of the 'flyover' school of architecture – is picturesquely tucked next to a raised section of the A40.

The offices are conveniently located near Wormwood Scrubs, but unlike the prison, Woodlands is designed to keep people out, not in. Eagle-eyed security guards ignore certain magazine editors, who have a habit of marching straight in. But people who work there are interrogated every time they come through the door.

The ingenious Jim Day has devised the technique of flashing his gold Beano Club card, Miami Vice-style, whenever he enters. Nobody knows why he does this. It doesn't do any good.

Rumour has it that some staff have acquired a vaulting horse and are digging a tunnel – into the Scrubs.

■ When the long-suffering David 'Tefal' Atherton recently left BBC Enterprises, his grateful... sorry... tearful colleagues presented him with a spare telephone.

David is world famous for not being able to bring himself to say goodbye when on the phone. Perhaps he's worn out the old one!

In loving memory

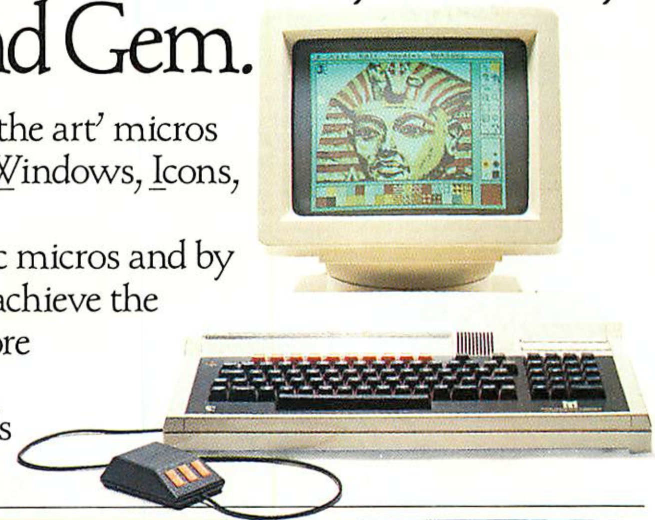
Alas, poor Micro Live, the last and now late TV computer programme. Comments from well-known industry figures ranged from 'Is that an animal programme?' to 'Possibly the richest source of transatlantic beanos ever dreamt up by the BBC hacks'.

The swansong broadcast was enlivened by a demonstration of a 'possible' new Acorn micro. Its superiority over the humble BBC micro was shown by comparing their speed with the PCW Basic benchmarks: only one machine managed the test without crashing. The BBC micro took about 14 seconds but 'the new micro would have finished by then, if it hadn't ... err'. Ahh, live TV.

Little oaks

Acorn's press conference to announce the financial results was the usual well-attended function. MD Brian Long explained to massed newshounds that the increased profits stemmed from increased sales. Ace reporter Orson Fact joined the three other hacks, representing massive press interest, in probing Acorn's PR defences.

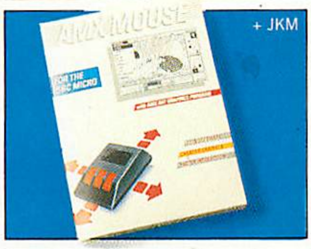
With the AMX range of Software, you can now forget about the Mac, the St., the Amiga, Windows and Gem.



It's no surprise that nearly all new 16 bit 'state of the art' micros now come with a Mouse and Wimp environment (Windows, Icons, Menus and Pointers) as standard.

With the BBC you already own one of the classic micros and by simply adding the AMX range of software you can achieve the same ease of use, freedom and versatility of much more sophisticated computers.

The AMX Mouse and compatible software – it's what you and your BBC micro have been missing.



ART AND MOUSE OPERATING SYSTEM

AMX MOUSE PACKAGE 16K Rom and Disc — £79.95

There's not much joy in a joystick and keyboards can be all fingers and thumbs. Acclaimed by the press as 'the best input device', already over 30,000 BBC users have adopted an AMX Mouse. Available for the BBC, B+, Master 128 and Master Compact. Please state version when ordering.

AMX SUPERART AND MOS (only) — £49.95.

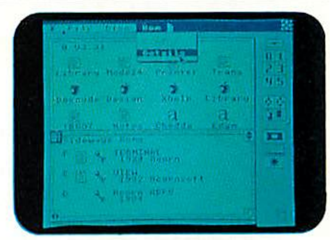




GRAPHIC DFS FRONT END

MAX 16K Rom — £19.95

MAX provides an easy to use graphic based front end to your computer's disc filing system including a comprehensive set of disc management operations such as cataloging, copying, deleting and re-naming, you can also run programs from within MAX. Available for the BBC, B+, Master 128 and Master Compact. Please state version when ordering.





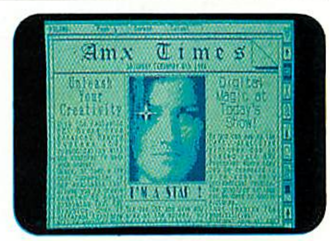
DESKTOP PUBLISHING

AMX PAGEMAKER 2 x 16K Rom, 2 x Disc — £49.95

Produce professional documents and newspapers with text and graphics, supplied with 16 variable typefaces it has many graphic functions including cut, copy, paste, etc. Available for BBC, B+, Master 128 and Master Compact.

EXTRA! EXTRA! 2 x FLIPPY DISC — £24.95

300k fantastic clip art, over 25 fonts, and utility software.



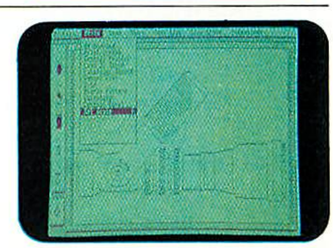


COMPUTER AIDED DESIGN

AMX DESIGN 32K Rom and Disc — £69.95

A highly sophisticated CAD package allowing drawings such as a PCB design up to the most intricate architectural drawing.

Advanced features include full zoom and macro facilities, 58 x 58 screen canvas, fully supported printer and plotter output. (Launch date Feb. 1987). Available for the BBC, B+, Master 128 and Master Compact.



There is also a growing list of additional AMX software requiring the original AMX Art Rom or Super Art Rom including:
AMX 3D Zicon **£24.95,** AMX Database **£24.95,** AMX XAM **£24.95** AMX Mind Games **£14.95,** *AMX Utilities **£14.95,** *AMX paint Pot **£14.95.**
*These programs are only suitable for use with the original AMX Art/Rom which can be purchased with a mouse for **£69.95**
A Mouse (only) can be purchased for **£34.95** direct from AMS, using the order form enclosed in each of the four major software packages (see screen shots).
These superb products are available from all good computer dealers or direct by cheque, access or visa. All prices include VAT and post and packaging.

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AMX SOFTWARE

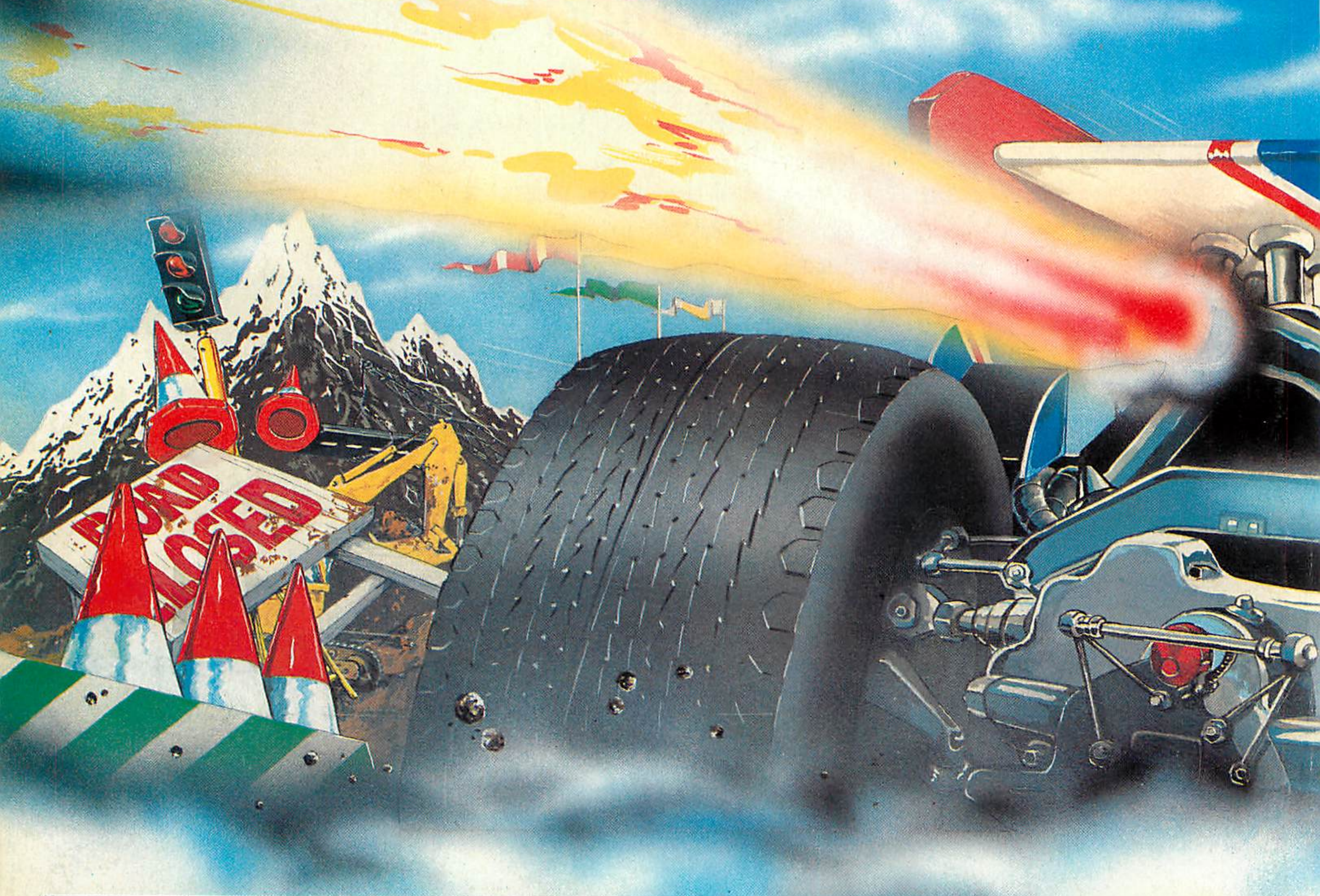
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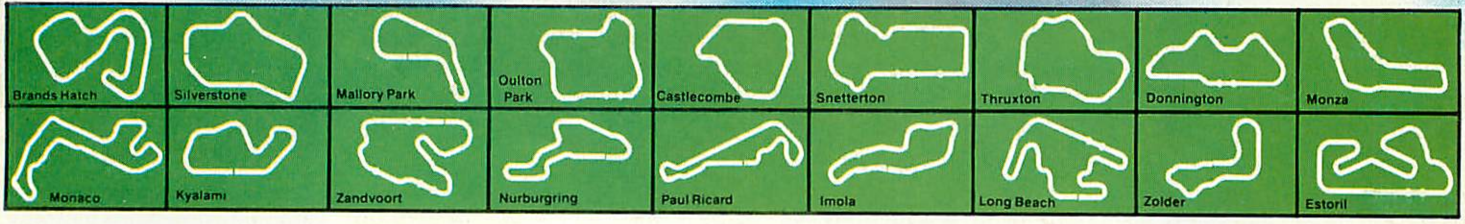
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